

SOUTHERN POWER AND INDUSTRY

Ad Index, page 110

AUGUST, 1951

In This Issue

CONFERENCES IN THE SOUTHWEST

Oil & Gas Div., ASME	40
Power Application Seminar	58

REPORTS FROM SOUTHERN PLANTS

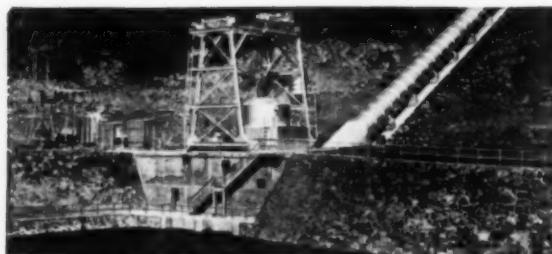
Florida Power Corporation—Bayboro	44
Southwestern Veneer Co.—Arkansas	49
Inco's "Ocean Test Tube"—North Carolina	54

ENGINEERING REFERENCE DATA

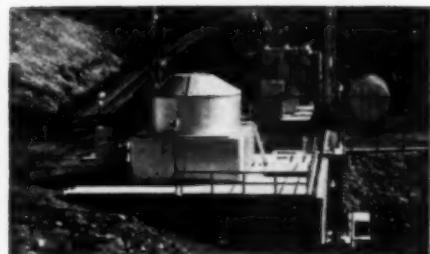
Bus Duct Application	50
Unit Heaters	62
Pneumatic Ash Conveying	72

For Full Table of Contents, See Page 3

Southwestern
Power Conferences
See Pages 40 & 58

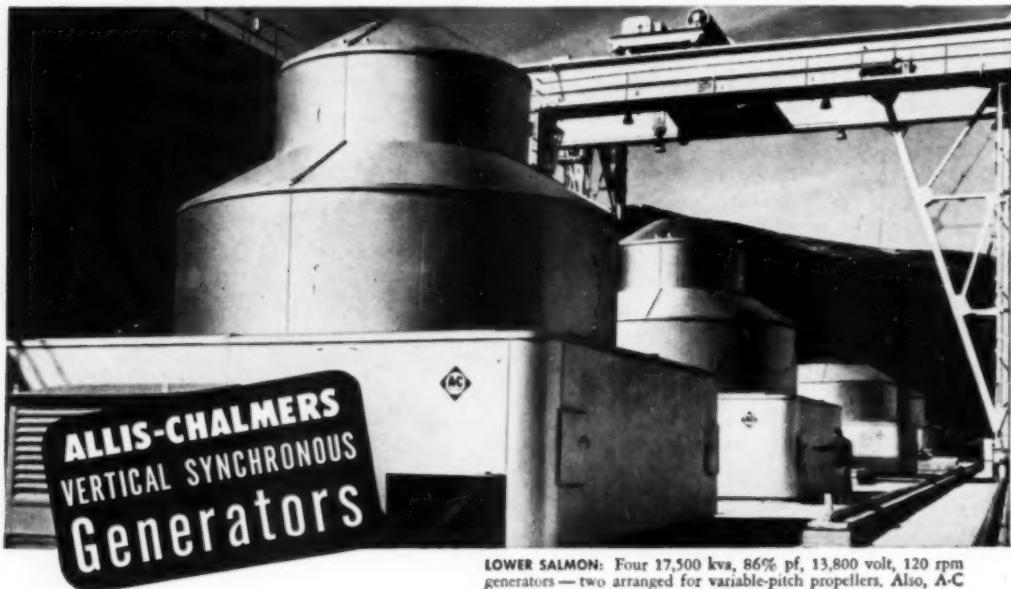


UPPER MALAD: One 8400 kva, 85.7% pf, 6900 volt, 225 rpm generator. Also, A-C 12,000 hp, 124 ft head Francis-type turbine, station-service substation, switchgear, main power transformer.



LOWER MALAD: One 15,500 kva, 87% pf, 6900 volt, 200 rpm generator. Also, A-C 22,000 hp, 157 ft head Francis-type turbine.

All generators are modified umbrella type (with upper guide bearings) furnished complete with outdoor housings.



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LOWER SALMON: Four 17,500 kva, 86% pf, 13,800 volt, 120 rpm generators — two arranged for variable-pitch propellers. Also, A-C 12,000 kva power transformer.

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Placed in operation in 1948 and 1949, these generators supply southern Idaho as part of the Northwest power pool. The Malad stations, which are re-

mote-controlled from the Lower Salmon station, operate 24 hours a day, seven days a week. Lower Salmon is used for load factoring (peak load operation) and runs at full load an average of about 10 hours a day every day of the year.

Whatever your power requirements

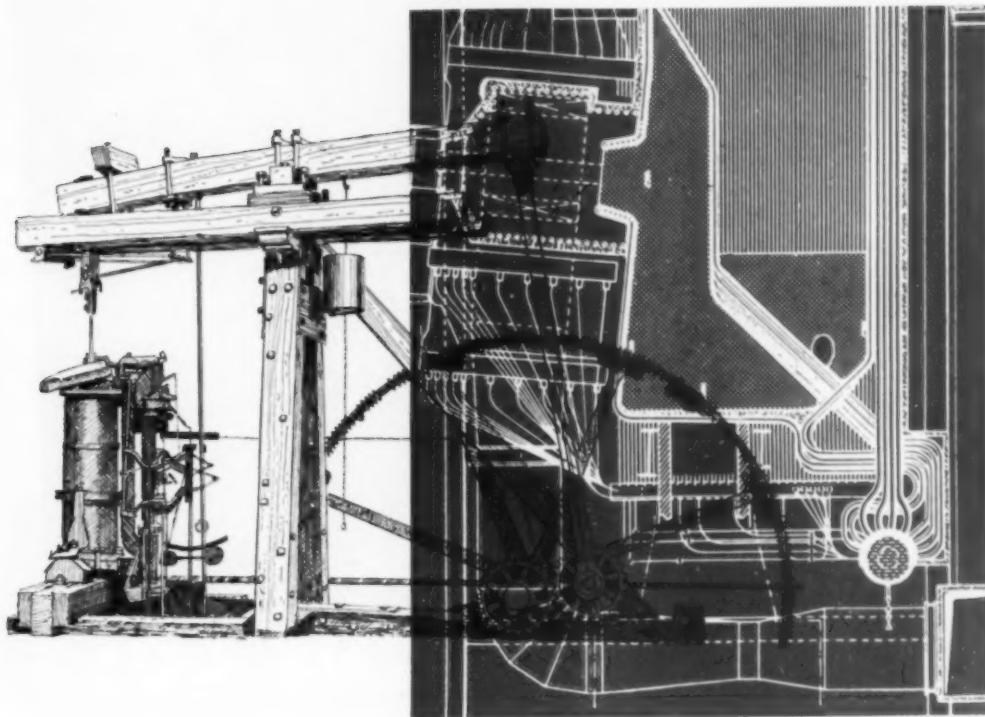
are, you can rely on Allis-Chalmers for efficient, reliable generators custom-engineered for your installation. Types, ratings and construction features are described in new bulletin 05B7549. Contact your A-C representative, or write Allis-Chalmers, Milwaukee 1, Wis.

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Watt would be horrified!



The condensing steam engine of James Watt made modern industry possible. Until he died in 1819, however, Watt argued stoutly that steam should be used only at a few pounds above atmospheric pressure. What would he think of central stations generating steam at pressures up to 2500 psi—or even of industrial power plants using today's "low" pressure of 400 psi?

Watt never thought of worrying about the water converted into steam for his engine. Today, high pressure, high temperature, and high rating make the conditioning of boiler water a complex problem in chemical engineering. In one plant, precision control of phosphate and silica at levels of only a few ppm may be the most eco-

nomical way of simultaneously keeping sludge off tube surfaces and silica off turbine blades. In another, better clarification of raw water may be the most practical line of attack on a tough problem of complex silicate scale.

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FOR EVERY OPERATING CONDITION

SOUTHERN POWER AND INDUSTRY

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AUGUST
1951



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CONTENTS

Oil and Gas Power Conference, Dallas, Texas	40
Another Extension for Bayboro, by R. B. Lee	44
Texas-Size Heat Pump	48
Stepping Up Production at Southwestern Veneer	49
Bus Duct Application, by J. Washburn	50
Truck-Pallet System in Towson, Maryland, Plant	52
International Nickel's "Ocean Test Tube"	54
Piston Rod Renovated at United Gas, Shreveport	56
Power Application Seminar, Dallas, Texas	58
Unit Heater Selection and Application	62
Pneumatic Ash Conveying, by A. W. Jenkins	72

PRACTICAL DISCUSSION

"Fish-Pole" Height Gage	78
Magnetic Separators Reduce Fire Hazard	78
Speeding Thread-Repair Operations	80
Electric Elevator Safety	80

DEPARTMENTS

FACTS AND TRENDS	5	NEW EQUIPMENT	92
BUYERS INFORMATION	16	NEWS OF THE MONTH	106
TIMELY COMMENTS	37	CATALOGS	114
INDUSTRY SPEAKS	39	INDEX TO ADVERTISERS	118

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Editorial and Executive Offices: SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E., ATLANTA 5, GEORGIA

Delta Solves Sequence Control Problem

with Allen-Bradley Special Panel

This special drilling machine, made by Delta Manufacturing Division of Rockwell Manufacturing Company, requires precision automatic control.

Delta designers adopted an 8-relay Allen-Bradley control panel with magnetic solenoid starter and manual disconnect unit for automatic sequence control.

For resetting the machine to handle a new drilling job, two Allen-Bradley oiltight push button stations with pilot lights are mounted within convenient reach of the operator.

The Bulletin 700 solenoid operated relays have established their reputation for amazing precision in closing and opening the circuit, as well as their complete dependability. These relays are good for millions of trouble free operations in any type of service.

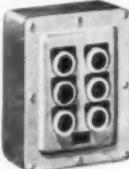
Leading machine tool builders are achieving more reliable machine performance with Allen-Bradley solenoid controls. Write for Bulletin 700 catalog, today.

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A few of the wide variety of "operators" which may be supplied with standard Allen-Bradley single or double contact blocks for machine tool service.

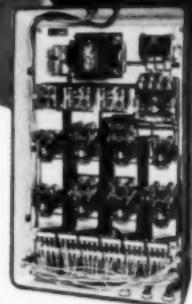
Bulletin 800T Oiltight Control Stations are available for surface or flush mounting with buttons, selector switches, pilot lights, and name plates for any need.



Oiltight "Stop" Button with 1 normally open and 1 normally closed contact.



Oiltight "Start" Button with 2 normally open and 2 normally closed contacts.



Control panel with cover removed to show arrangement of relays, magnetic switch, disconnect unit, control transformer, protective relays, and terminals.

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Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

August, 1951

DALLAS, TEXAS AND THE SOUTHWEST were hosts the week of June 25 to the 23rd Annual Conference and Exhibit of the Oil & Gas Power Division of A.S.M.E. and also a Southwestern Industrial Power Application Conference sponsored by the General Electric Company.

On-the-spot activity reports of these two important Southwestern meetings are featured in this issue of SP&I. Papers of particular interest to Southern and Southwestern plant engineering personnel have been abstracted. The G.E. Conference includes discussion on small plant power distribution, selecting the right motor, adjustable speed drives, polyphase motors, lamps for sight and heat and air conditioning.

TWO INTERESTING EQUIPMENT DEVELOPMENTS are featured in the New Equipment section of this issue—a new tube de-expanding tool and miniature indicators and control units.

"Pulling" tubes often results in longitudinal scoring of tube sheet hole, upsetting of ligament and hole enlargement. With the new Franklin Manufacturing Co. DE-EXPANDING TOOL, there is no cutting, drilling or pulling. One right hand tool is used and one left hand at the opposite end of the tube to be removed. One impacts to the right, the other to the left at the same time. Tube is "torqued" until de-expanded.

Space savings are considerable with the new MINIATURE INDICATORS and CONTROL UNITS of Bailey Meter. A new Multi-Point indicator uses 87 per cent less space than its standard size counterpart. New instruments are designed for mounting on console type panels. These panels will be more than 50 per cent smaller than any previously available.

NEED SOME DIAMONDS? The only diamond mine in the U.S., near Murfreesboro, Arkansas, has not operated for several years. The deposit is not now considered commercial, although since its discovery in 1906 it has produced about 48,000 diamonds, mostly industrial but some of gem quality. Natural Resources Notes of the U. S. Chamber of Commerce reports that the owners have now opened the property to any visitor who wants to try to find a diamond.

HOW CORROSIVE CAN YOU GET? An issue of the Monsanto Magazine states that one of the company's corrosion inhibitors—038 by designation—is a formulation intended to hold down the corrosive quality of shellac and other non-aqueous products in their containers. Yet absurdly enough, the inhibitor itself has such an extreme acid action that in concentrated form it must be shipped in its own double-lined, specially constructed drums.

The answer is that as a protector this inhibitor is used in very low percentage and reacts against steel to form an inert coating which is insoluble in alcohol, or like products, thus protecting the product container for continued reuse.

SOOT IS PAY DIRT for many manufacturers, and plant operators have experimented with collection bags for years. Newest development in the field is du Pont's Orlon acrylic fiber. Advantages reported by manufacturers who are using these new bags, are its good-to-excellent resistance to mineral acids, fair resistance to weak alkalies, and that it is not harmed by common solvents, oils, greases, neutral and most acid salts. It also offers dimensional stability to heated gases and resistance to acids and acidic fumes at high temperatures.

INDUSTRIAL AND POWER PLANTS can aid defense and provide a public service by conducting an emergency inspection of plants and properties and channeling idle, obsolete machinery and equipment to the nearest scrap dealer. Inventories of heavy iron and steel scrap at the nation's steel plants and foundries are dangerously low. The task of rebuilding depleted mill inventories of heavy scrap is a big one and immediate assistance is needed.

Dormant heavy scrap includes all idle obsolete machinery and equipment in plants, unusable tools, dies and jigs, damaged or useless road building equipment, condemned bridges and other steel structures. It can be found almost anywhere. These things must be declared obsolete by someone in authority, sold as scrap, and started moving back to steelmaking furnaces. The needed tonnages of scrap do not have to be manufactured—they need only to be found.

CORROSION RESEARCH is a job which is continuing, not in temporary structures in improvised quarters, but utilizing permanent flexible equipment designed for continued experimentation. One of the big jobs is being done in the Harbor Island Laboratory of International Nickel Company at Wrightsville Beach, North Carolina. A recent editorial trip to the extensive project is reported in this issue. It is corrosion test headquarters for studies being made by Inco and participated in by many cooperating companies.

THE COLD FACTS ARE that 15 to 20 per cent of our national output is going into non-productive nothingness, in building implements that will either be rusted away or shot away. It is an expense we can ill afford but this preparedness work must be done if we are to preserve our freedom and way of life.

With such an incubus pressing upon our very economic life, be assured that the rest of the 80 per cent of our economy must be efficient and vigorous. It must be marked by new and better methods of production, in modernization and cost-saving devices. (Comment by Horace Zimmer, Manager of Districts, General Electric Company, before the G.E. Power Conference in Dallas, Texas—see our staff report of the conference featured in this issue).

WHERE'S THE STEEL GOING?—At the semi-annual meeting of the Dallas Manufacturers and Wholesalers Association in Dallas, Texas, Arthur V. Wiebel, president of the Tennessee Coal, Iron and Railroad Company, United States Steel subsidiary at Birmingham, Alabama, emphasized that the capacity of steel mills in the country is being increased by more than 26 million net tons annually.

On AVAILABILITY FOR CIVILIAN CONSUMPTION, he commented that "much of the present increase will go into defense. However, it is safe to say that, while we may not be able to furnish all of the steel everybody wants, enough must be made available to meet at least minimum civilian needs."

On OBSTACLES—"We cannot be expected to have it all done by yesterday. It takes time to build anything as big and as complicated as a steel plant. Equipment must be built to our specifications by companies just as harassed as we are by the large output expected. They also have the problem of securing the raw materials they must have before they can fill their orders."

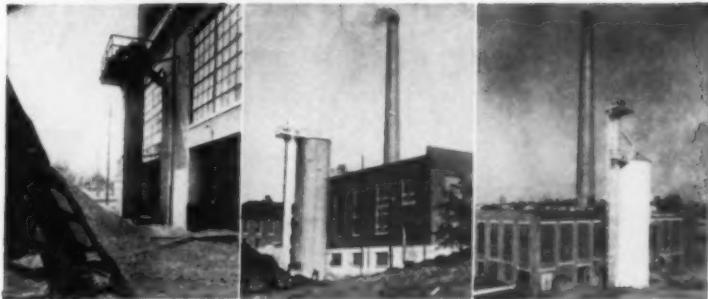
On EARMARKED PRODUCTION—"defense orders placed with the Tennessee Company for June took 99 per cent of its bar steel, 89 per cent of its galvanized sheets, 83 per cent of its hot rolled sheets, 82 per cent of the structural, 72 per cent of the wire products and 71 per cent of all the steel plate it makes."

On UTILIZATION—"Actually, things are not as bad for the manufacturer as they seem. While most of the steel can no longer be converted into civilian goods, it must be fabricated into war material. Who is going to do the job? Naturally, those who have been buying steel to manufacture into consumer products. Some have already converted to war production. Others will be called upon to make the change as the defense preparations go into high gear."

Write the editors for additional information on any of the above items.
SOUTHERN POWER & INDUSTRY 806 Peachtree St., N.E. Atlanta 5, Ga.

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**POWER
PLANTS**



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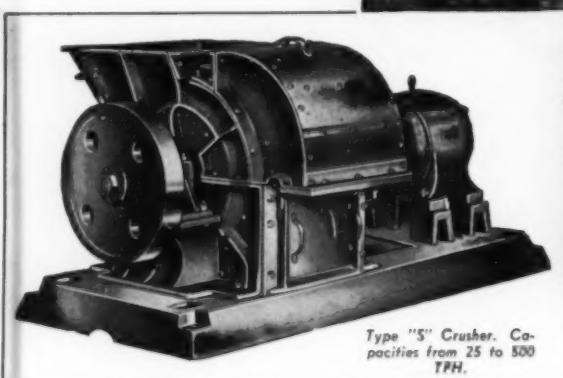
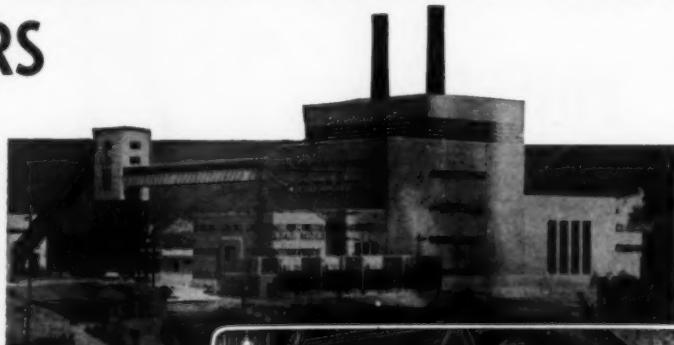
MANUFACTURERS

TWIN AMERICAN CRUSHERS PRODUCE 3,570,000 TONS OF CRUSHED COAL IN 5½ YEARS

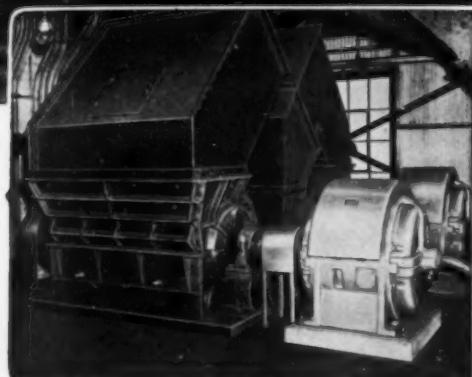
16" ROM

Reduced to $\frac{3}{4}$ " at
900 Tons Per Hour

The Ohio Power Company Tidd
Plant at Brilliant, Ohio



Type "S" Crusher. Capacities from 25 to 500 TPH.



Note the compactness of area in which these two direct motor-connected 60S Americans are installed

In commercial service since September, 1945, at the Tidd Plant of The Ohio Power Company, Brilliant, Ohio, the twin American 60S Crushers shown in the installation above have reduced 3,570,000 tons of 16" run-of-mine bituminous coal to a $\frac{3}{4}$ " product.

Even with this record, these crushers—each rated at 450 tons per hour—were not fully loaded until November 1, 1948, when the plant started commercial service of its second turbo-generator.

CRUSHERS NOW HANDLING 420,000 TONS PER UNIT PER YEAR

Close to half a million tons per unit . . . the dependable, uniform, high tonnage at The Ohio Power Company plant is typical of American performance. Rugged Americans are producing unfailingly at other plants throughout the world, too—offering a complete once-through crushing plant in one compact unit.

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WRITE for Bulletin "CRUSHING COAL AT LESS THAN 1¢ PER TON"



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Distributors — All principal Cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ontario

★ SECURITY COMES WITH STRENGTH ★



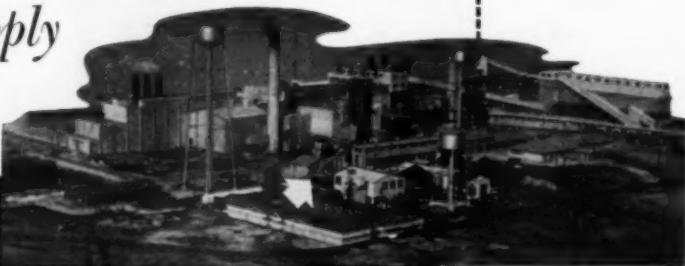
★ THE ABRASIVE PRODUCT BAY STATE Koolpore Tool Room Grinding Wheels.



PHOTO COURTESY LAPONTE MACHINE TOOL CO.

★ THE GRINDING JOB BROACH SHARPENING. This type of broach is used in finishing the inside diameter of tank track links.

*one Infilco installation
treats both boiler feedwater and
pulp mill supply*



This modern 64,000 ton mill at Fernandina, Fla., using deep well water, successfully treats both boiler feed and process water with a 2.2 mgd Accelerator® followed by Zeolite softening.

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FOR INDUSTRY"

Complete information on
Infilco equipment for water
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HIGH in dissolved minerals,
alkalinity, magnesium
and calcium hardness
APPRECIABLE iron and color
LARGE AMOUNT of silica present

INFILCO-POLISHED

ZERO hardness
ZERO iron and color
LOW alkalinity
and silica



INFILCO INCORPORATED

Tucson, Arizona

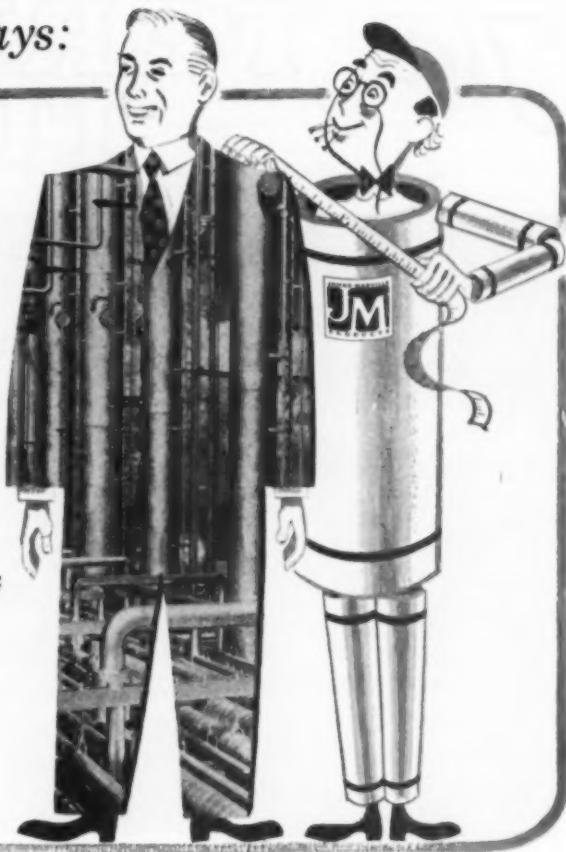
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World's Leading Manufacturers of Water Conditioning and Waste-Treating Equipment

Mr. Insulation says:

"Buying
insulation is
like buying
a suit of
clothes:

**—the better the materials;
the more expert the
tailoring, the better
your investment"**



Just as no one cloth can be used for every suit of clothes, there is no one raw material that can serve as the ideal insulator for every industrial insulation job.

For this reason, Johns-Manville manufactures a wide variety of industrial insulations—of asbestos and other raw materials—each of which is designed for a special purpose. These insulations span the entire range of temperatures from 400 F below zero to 3000 F above.

But, again, there is much more to the story of insulations than their manufacture. In order

to get the greatest return from your investment in them, they must be expertly engineered to the job, and then skillfully applied.

Johns-Manville makes available to you the service of experienced insulation engineers, and highly skilled mechanics for the proper application of Johns-Manville insulations.

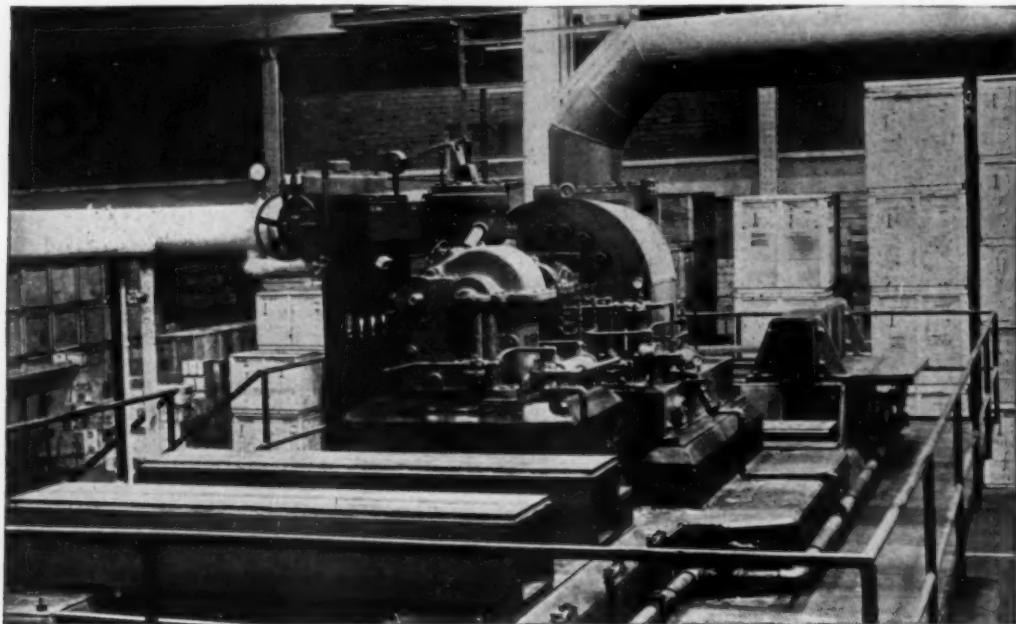
If you are contemplating an insulation installation for your plant, it will pay you to look into this Johns-Manville insulation service. For further information just write Johns-Manville, Box 290, New York 16, N. Y.

Johns-Manville

first in

INSULATIONS

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Flexible POWER and SPEED In This Test Unit

This new test stand for air- and gas-compressors at the Carrier Corporation plant in Syracuse, N. Y. meets a wide range of power requirements with a special-purpose Terry Turbine. Compressors tested may require the delivery of as much as 2500 hp at speeds as high as 14000 rpm, or the same power at 6000

rpm. This wide variation in speed was met by Terry engineers with a single 6000 rpm turbine having a double shaft extension. One extension is for direct connection to a compressor operating at not over 6000 rpm. The other extension delivers power through Terry speed-increasing gears at speeds up to

14000 rpm. The result is a compact unit that represents an economical solution to a special problem. It is typical of what Terry engineers do regularly.

Any of our district representatives will gladly give you full information on a turbine for your special purpose.



TT 1183

They keep coming back for more!

Companies that have bought VU Boilers continue to buy them. In fact, a substantial proportion of all VU Units, in service and on order, have been purchased by organizations whose selection reflects their own first-hand experience. For example —

A STEEL COMPANY now has a total of eleven VU Boilers in four different plants. Starting with three units in 1936, it has reordered three times . . . most recently in the fall of last year with an order for three more units.

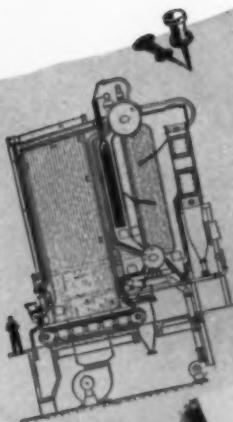
A TEXTILE MANUFACTURER ordered two VU Units in 1936. Another unit was installed in 1940 and a third in 1944. Still another textile company installed one unit in 1945, a second in 1949 and has just ordered another.

A REFINING COMPANY ordered one VU Unit in 1937, another in 1940 and another in 1949 for one of its plants; also two in 1942 and one in 1947 for another plant.

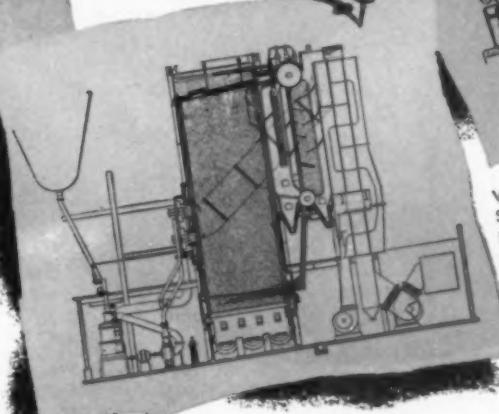
A SEWAGE TREATMENT PLANT in one of America's large cities is another consistent buyer of VU Boilers. Its initial order in 1936 was for two units. Since then it has reordered three times, and now has a total of seven VU Boilers in service.

The story is the same wherever you go — in all sections of the country American industry is ordering and *reordering* VU Units. Why? Because the VU's advanced design, sound construction and consistent reliability have become a service-proved answer to lower steam costs. Once you have a VU Unit in service you soon know why so many large steam users *keep coming back for more*.

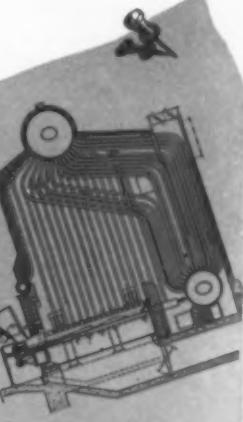
ED-481A



VU-50 Unit fired with pulverized coal. The capacity of unit shown is 200,000 lb of steam per hr; operating pressure 560 psi; steam temperature 760 F (VU units are in service for capacities up to 350,000 lb of steam per hr).



VU-50 Unit fired with C-E Spreader Stoker (continuous discharge type). The capacity of unit shown is 80,000 lb steam per hr; operating pressure 425 psi; steam temperature 650 F.



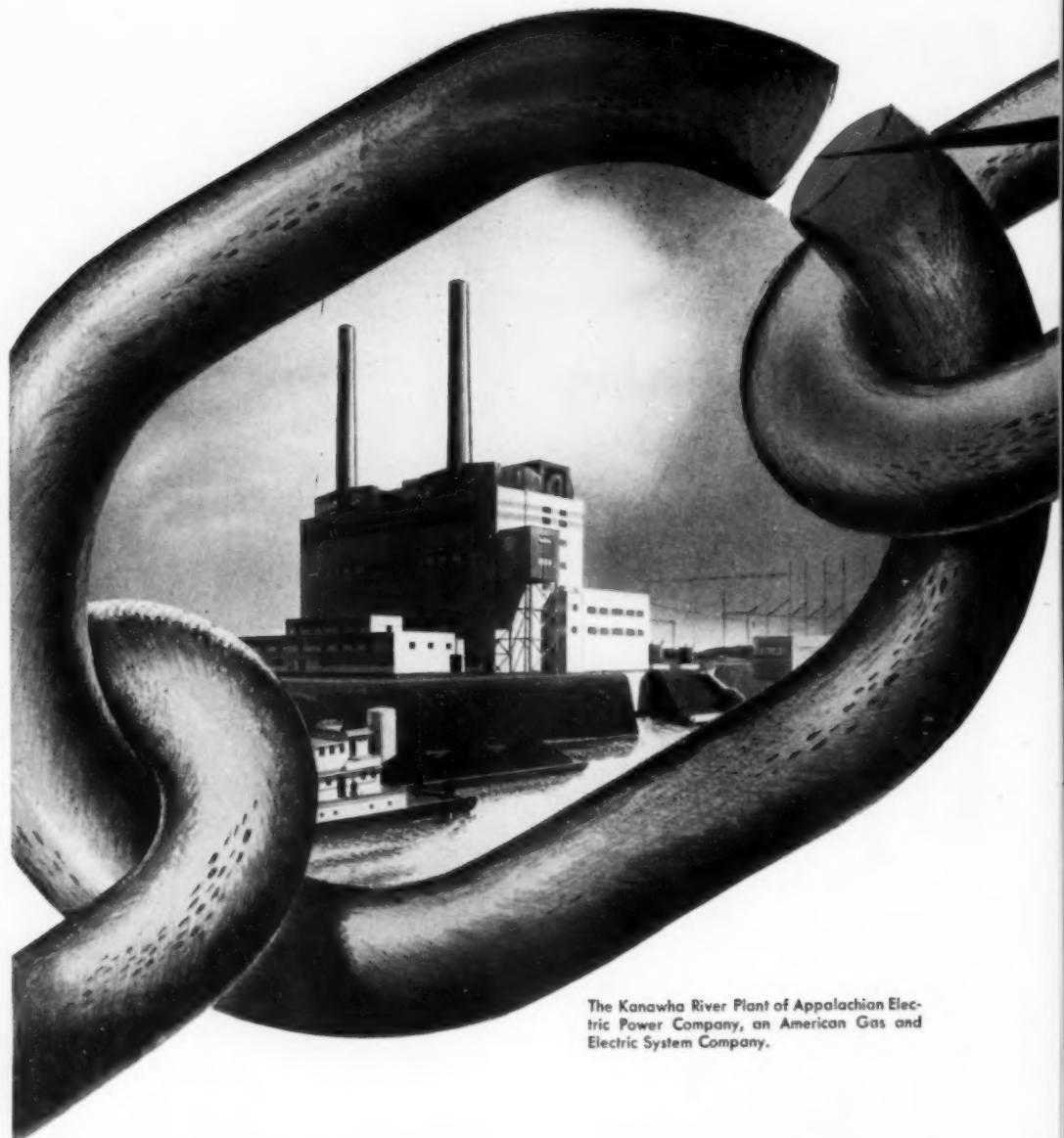
VU-10 Unit fired with Type E Stoker. VU-10 Boilers range in capacity from 10,000 to 60,000 lb steam per hr. They may be fired by spreader, underfeed or traveling grate stokers or by oil or gas.



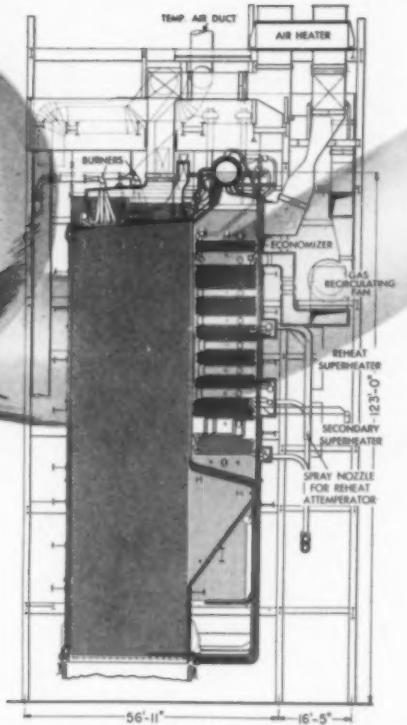
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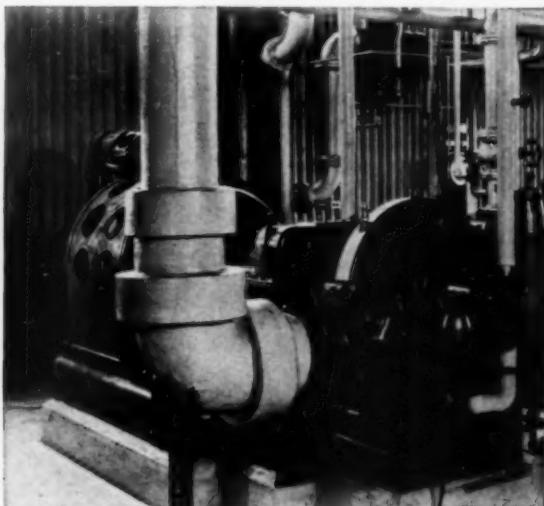
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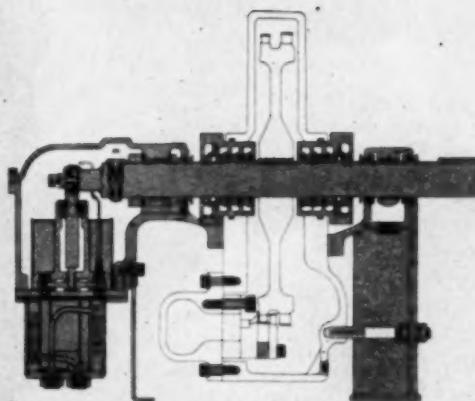
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MECHANICAL- DRIVE TURBINES



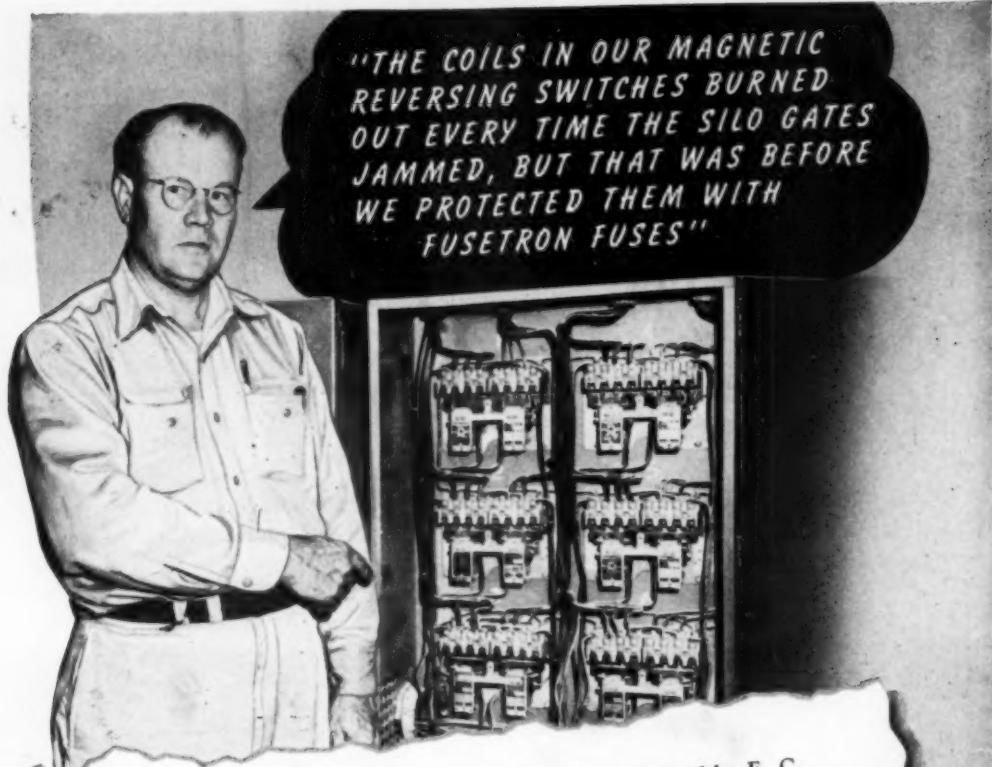
DEPENDABILITY is built into the DP. Positive lubrication through automotive-type bearings adds years to the life of the turbine. Special steel nozzle plate, self-lubricating graphite packings, and Monel-sprayed shaft are examples of design features that spell reliability.



APPLICATION FLEXIBILITY As the shaded parts in the diagram illustrate, most DP parts are identical on all frame sizes and ratings. In this way, you can adapt a DP for different job requirements with only minor changes. A different nozzle plate gives you a new horsepower output. A change in governor gears provides a new speed range. DP's are rated from 10 to 1200 HP and 1000 to 5000 rpm, and with slight modification, can deliver up to 2000 HP and 10,000 rpm. During a change in plant operation, the DP's flexibility will save you money.



EASY MAINTENANCE Because most parts are interchangeable on all models, spares can be stocked at low cost. A spare parts kit, containing 91 items, can be obtained with the turbine. This simple method of stocking spares lowers maintenance costs and provides protection for several DP's in your plant. All models, regardless of frame size, horsepower, or speed ratings, have identical shaft height, keyways, and coupling fits. Thus, installation problems are simplified; you can move these center-line supported units from job to job without a custom line-up.



"Sure!" you can quote me," continues Mr. E. C. Willy, Chief Electrician, H. J. Kaiser Co., Radum Plant, Pleasanton, Calif.

"In the past, we found magnetic reversing switches welded the main contacts when Silo Gates jammed. When reverse control operated, the armature could not properly engage, resulting in a burned out coil.

"The coils cost about \$4.00 each, but most important was the substantial production loss each time the coil burned out.

"We now have 4/10 ampere Fusetron dual-element fuses installed to protect these coils. During the year 1950 we blew about 100 Fusetron fuses, but didn't lose any coils. This represents a saving of at least \$400.00 in coils and kept me from being dragged out of bed at night, an occurrence that often happened before. Then, too, we can replace burned out Fusetron fuses much faster than we can replace coils, to say nothing of the valuable production time we save."

Facts about Fusetron dual-element Fuses

- The fuse link element opens on short-circuit — the thermal cutout element protects on overloads — the result, a fuse with tremendous time-lag and much less electrical resistance.
- They have the same degree of Underwriters' Laboratories approval for both motor-running and circuit protection as the most expensive devices made.
- Made to the same dimensions as ordinary fuses — fit all standard fuse holders.
- Obtainable in all sizes from 1/10 to 600 ampere, both 250 and 600 volt types. Also in plug types for 125 volt circuits.
- Their cost is surprisingly low.



"You too, can get 10 Point Protection

by using

Fusetron DUAL ELEMENT Fuses"



- 1 * Protect against short-circuits.
- 2 Protect against needless blows caused by harmless overloads.
- 3 Protect against needless blows caused by excessive heating — lesser resistance results in much cooler operation.
- 4 Provide thermal protection — for panels and switches against damage from heating due to poor contact.
- 5 Protect motors against burnout from overloading.
- 6 Protect motors against burnout due to single phasing.
- 7 Give DOUBLE burnout protection to large motors — without extra cost.
- 8 Make protection of small motors simple and inexpensive.
- 9 Protect against waste of space and money — permit use of proper size switches and panels.
- 10 Protect coils, transformers and solenoids against burnout.



★ Fusetron Fuses have high interrupting capacity as shown by tests of Electrical Testing Laboratories of New York City in December 1947.

Don't Risk Losses!

One **destroyed** switch or panel . . .

One **needless** shutdown . . .

One **lost** motor . . .

May cost you far more than replacing every ordinary fuse with a Fusetron dual-element Fuse.

Mail the Coupon Now!

Bussmann Mfg. Co., University at Jefferson
St. Louis 7, Mo. (Division McGraw Electric Co.)

Please send me complete facts about FUSETRON dual-element Fuses.

Name. _____

Title. _____

Company. _____

Address. _____

City and Zone. _____ State. _____

751

Republic Tips

get to the men who
buy and use the
hose you sell

save hose users time and money



Never kick a hose to stop flow. Use shut-off nozzle for this purpose or, better still, close valve at connection end. The latter is a must for steam and high pressure fluid hose.



REPUBLIC'S FAIRWAY WATER HOSE
LASTS LONGER, OPERATES MORE
EFFICIENTLY, COST LESS TO USE!!!

Send water down the smooth bore of Fairway Hose and you get the most economical delivery service possible.

Fairway is a braided hose, built of top quality materials. It is extremely flexible and easy to handle. High tensile strength, rubber-impregnated, fabric carcasses stand up under high, surging pressures while the tough outer cover resists abrasion, cutting and weathering.

All standard sizes are available in 50 ft., 100 ft. or longer production lengths, supplied on reels or in bales.

• Makes no difference whether you're using Water Hose, Steam Hose, Air Hose or all three . . . these Republic Rubber hose application tips help you get more efficiency and longer uninterrupted service at less cost.

What's more, your local Republic Rubber Distributor can show you many additional ways to save money through proper selection and use of Hose, Belting, Packing and other products of Industrial Rubber.

He's an expert in his field, representing Republic Rubber, the recognized specialist in the field of Industrial Rubber.

Contact him today or write direct for a free, but thorough analysis of your requirements.

Do not subject hose to stretching or to continual use at right angles to your wall connections. Such treatment will eventually fracture the tube, causing premature hose failure.



INDUSTRIAL RUBBER PRODUCTS BY
REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO



This man... HELPS YOU CUT COSTS!

Availability

is worth money to the manufacturer.
Cost reductions, increased profits made possible by new things
become effective only when the new things are in your plant.

There is a man in your market who makes it his business
to learn all about, and to procure, the new things
developed for production and maintenance operations.

He enables you to see the new product, tool or machine
and to know exactly what it will do before you buy.

He will take it off his floor or out of his great stock and transport
it to your plant the same day you decide that you want it.

Availability is his specialty.

Dependable

"This man" is an industrial distributor or a
specialist in certain industrial items. You will
find him listed in the classified section of your
telephone book—most likely under the heading
Bars, bronze or Bearings, bronze. If he is the
leading distributor, he almost certainly is the
Bunting Distributor. He carries in stock for your
money saving convenience Bunting Standard
Stock Industrial Bearings, Electric Motor Bear-
ings, and Precision Bronze Bars—ask him for
catalog

There are approximately 2000
Industrial Distributors serving
every industrial section of the
United States. In 1948 their
total sales were more than
\$3,000,000,000. They carry an
average inventory of \$500,-
000,000. In their trucks, up to
6 times per year, fill 200,000
orders per day, have 12,000
outside salesmen and engi-
neers, 10,000 inside telephone
order expeditors, operate
8000 trucks delivering mer-
chandise on which their
average net profit is .0292
cents per dollar of sales.



Bunting®

BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

THE BUNTING BRASS & BRONZE CO., TOLEDO 9, OHIO

Copyright 1950 by The Bunting Brass & Bronze Company, Toledo, Ohio



Hard scale, formed on the trays of deaerating evaporator preheaters, is no longer the big problem it used to be.

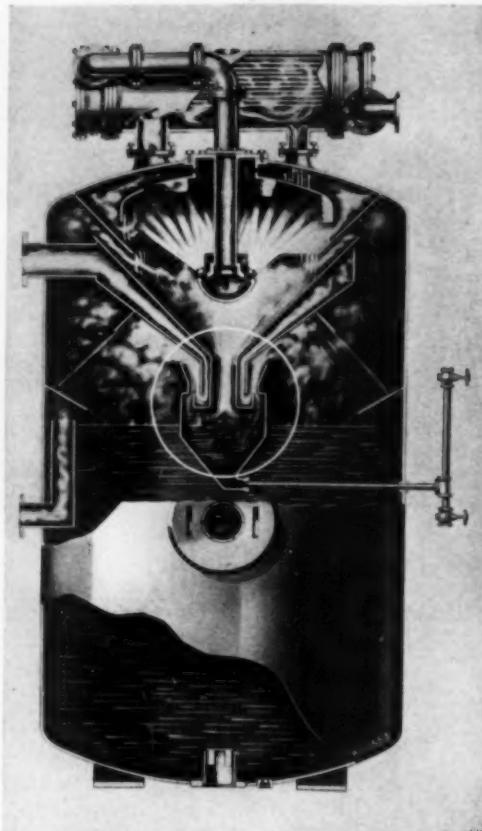
In a large central station (name on request), the preheaters had to be cleaned every three weeks, and the units were completely shut down at that time from eight to ten hours.

Then Worthington steam-jet deaerators were installed—with a "blowdown" head designed by Worthington engineers. This special head allows the operator to remove harmful deposits at regular intervals while the unit continues in service. It also provides for simple and speedy acid cleaning of critical parts, when necessary, without even opening an access door or removing any parts from the unit.

Compare The "Time-Outs"

The Worthington unit, given a short blowdown once each shift, stays in continuous operation with maximum deaeration for periods of at least 8 months. When the acid treatment is given at the end of that period, the job is finished in under three hours.

Compare this with the former record. Then—8 to 10 hours outage every three weeks and labor by a crew of men. Now—with Worthington's blowdown head—operation uninterrupted during regular short blowdown, with a shutdown for acid cleaning only once in



almost a year, requiring only one man and three hours!

Worthington Makes Deaerating Equipment News

Developments like this, applicable to any deaerators operating under conditions of scaling, are typical of Worthington's engineering firsts in water treating and deaerating equipment.

Worthington manufactures all of the equipment needed in a complete water treating installation. For further information on why there's more worth in Worthington, address Worthington Pump and Machinery Corporation, Steam Power Div., Harrison, N.J.

WORTHINGTON



S.I.

A GREAT
TEAM
IN
STEAM



Feedwater
Heaters



Ejectors



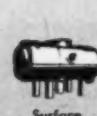
Boiler Feed
Pumps



Water Treating
Equipment



Steam
Turbines

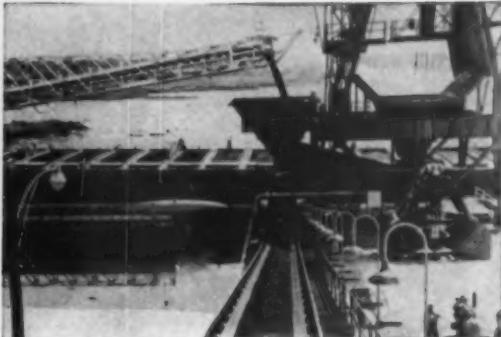


Surface
Condensers

LINK-BELT engineering experience...

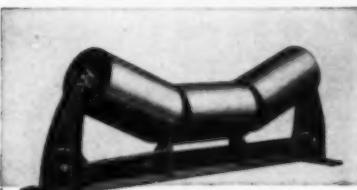


Link-Belt supplied this power plant with complete belt conveyor system for unloading, storing and reclaiming coal.



Receiving end of belt conveyor system, showing boat self-unloading coal into hopper. Another hopper and feeder handle barge coal.

Plus LINK-BELT quality components...



SERIES 100 TROUGHED BELT IDLERS. Strong, balanced integral rolls revolve on high-grade roller bearings. Grease-in, dirt-out seal, large reservoir preserve lubricant.



RUBBER-TREAD IMPACT IDLER for loading points protects the belt by absorbing the shock of heavy materials or lumps delivered from above.



BELT-TRAINING IDLER for automatic belt positioning. The actuating rolls respond to slightest contact — quickly recede and center the belt to minimize wear.

...add up to your best bet in **BELT CONVEYORS**

WHAT'S your materials handling problem? Tonnage, distance or a combination of the two? Heavy or light materials? Large lumps or fines? Continuous or intermittent operation?

Whatever the conditions, you'll find the right answers at Link-Belt. For Link-Belt designs conveyor systems to meet your requirements. Backed by unmatched materials handling and power transmission experience, our conveyor specialists help you and your consultants get the right equipment in the right place.

One Source—One Responsibility

Link-Belt makes all the various elements—all types and sizes of idlers, takeups, pulleys, trippers, bearings and power transmission drives. Plus all related equipment—other types of conveyors, feeders, elevators, car dumpers and shakers.

And Link-Belt will build your supporting structures and enclosures . . . install the job completely. One source — one responsibility. Every detail receives the proper attention to assure you an efficient, trouble-free, long-life conveying system.

The next time you need belt conveyor engineering assistance, call the Link-Belt specialist in our office near you.

LINK-BELT
THE SYMBOL OF QUALITY
LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Atlanta, Dallas 1, New Orleans 12, St. Louis 1, Charlotte 2, N.C., Baltimore 18, Birmingham 3, Houston 1, Jacksonville 2. Distributors Throughout the South.

12-380-D

Could You Use
SAVINGS
Like These?

40% less
Fuel Consumption
50% more
Boiler Capacity

**Bailey Meters and Controls
Insure Savings at
Kerr Bleaching & Finishing Works,
Concord, N. C.**

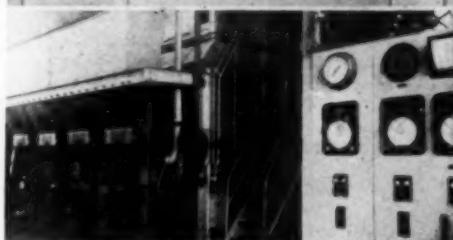
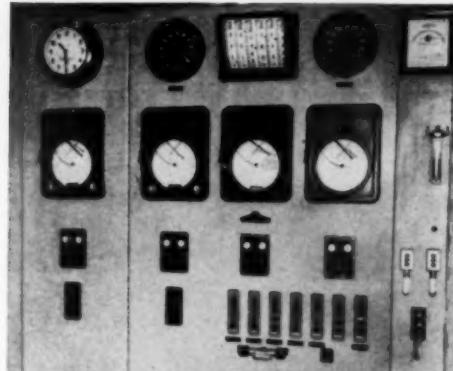
The key to complete returns on any investment in new power equipment is a fully co-ordinated system of meters and controls. It's the old story, the tail that wags the dog—careful attention to this comparatively minor part of the over-all installation cost can mean the difference between profit and loss in operation.

Here's where Kerr Bleaching & Finishing Works has cut operating costs—by installing *co-ordinated* Bailey Meters and Controls. The installation includes Bailey Meter Combustion Control, and Bailey Two-element Feed Water Control.

Such a co-ordinated system is an important plus for Bailey customers. Nowhere else can you buy such a complete range of equipment, selected without bias to do the best job for you. Nowhere else can you find such expert engineering service, immediately available through conveniently located direct sales and service representation. May we help you?

Call our local branch office or write for Bulletin 15-H.

A-113



Control panel, showing completely co-ordinated Bailey Meters and Controls at Kerr Bleaching and Finishing Works, Concord, N. C.

**BAILEY
METER
COMPANY**

1028 IVANHOE ROAD
CLEVELAND 10, OHIO

Controls for Steam Plants

COMBUSTION • FEED WATER
TEMPERATURE • PRESSURE
LIQUID LEVEL • FEED PUMPS



DUAL-FUEL...

*Teamed with Steam
in new dual-power plant...*

Here is an ideal combination of generating power—dual fuel engines, backing the big steam generating station being built for this group of six R.E.A. Cooperatives.

Why Dual Fuel? Dependability; fast, easy starting; lower operating costs. Although ideal for peak load and standby service, these engines seem destined for 24-hour duty in view of the current rate of increase in load in this rural area.

Why Fairbanks-Morse? Many types and sizes of proved dual fuel engines (including these 3500 hp. units) to meet a variety of load conditions; more than 50 years of experience in working with and solving the problems of publicly owned power groups.

For details on how this group's experience can help solve your power problems, write . . . Fairbanks, Morse & Co., Chicago 5, Illinois.



FAIRBANKS-MORSE,
a name worth remembering

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY
PUMPS • SCALES • RAIL CARS • MAGNETOS • FARM MACHINERY

10,500 FAIRBANKS-MORSE DUAL FUEL hp.

Three 3500 hp. Model 31's in new central station for Northeast Missouri Electric Power Cooperative.



Facts About this Latest FAIRBANKS-MORSE DUAL FUEL Installation

Three 3500 hp. Fairbanks-Morse Model 31-AD-18 engines rated @ 350 hp/cylinder @ 277 r.p.m. . . . can be put on the line in less than a minute from a cold start . . . will operate at an estimated total fuel cost of under 4 mills/kw-h . . . can be switched instantly from oil to gas or from gas to oil . . . are complete with well-arranged automatic accessory equipment.

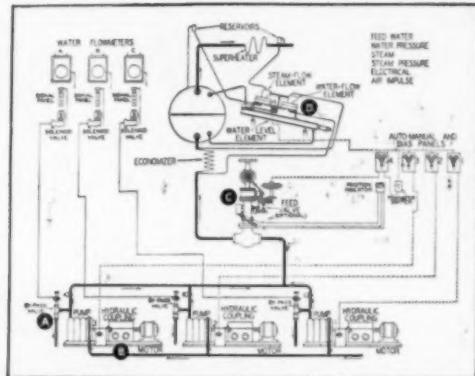
COPES Applied to Hydraulic Couplings

GIVES PRECISE FEED AND LEVEL CONTROL
at PLANT YATES of GEORGIA POWER COMPANY

Remarkably close feed-flow and water-level control is being demonstrated daily by the COPES Balanced Flow Control at Plant Yates of Georgia Power Company, Newnan, Georgia. Units 1 and 2 went into service late in 1950.

Each unit includes a 3-drum, dry-bottom, radiant-type Combustion Engineering-Superheater boiler designed for a maximum continuous rating of 975,000 pounds per hour. Loads have been carried as high as 1,050,000—as low as 250,000—pounds per hour.

The COPES Control, applied through the hydraulic couplings of the feed pumps, matches feed flow almost perfectly to steam flow, and stabilizes water level within plus-or-minus one inch. Independent of meters and other controls, it can remain on full-automatic when they must be out of service for any reason. Duplicating COPES Control is on order for Unit 3, scheduled to start operation next winter. For complete data on COPES Balanced Flow at this utility write for Bulletin No. 489.



Schematic shows COPES Balanced Flow Control installed for each boiler at Plant Yates. Responsive to three influences—steam flow, feed flow and water level—COPES applies air impulses to position individual controller for the hydraulic coupling of each motor driven pump. Two pumps are normally paralleled, with third on standby, but any pump can be cut in or out by pushing the button to start or stop its motor.

Feed valve is normally wide open, but can be cut into automatic service at any time.

COPES Minimum Flow Control protects the pumps against overheating on light loads.

NORTHERN EQUIPMENT DIVISION

Continental Foundry & Machine Company

813 GROVE DRIVE, ERIE, PENNSYLVANIA

Headquarters for Feed Water Regulators • Pump Governors • Differential Valves
• Level Controls • Hi-Low Alarms • Reducing Valves • Desuperheaters



(A) COPES Recirculating Valve used with the Minimum Flow Control System to protect the pumps on light loads.



(B) Air impulses from the COPES Balanced Flow Control actuate this controller on the hydraulic coupling to control the speed of each boiler feed pump.



(C) The COPES Feed Valve, installed in a vertical line, is normally wide open but may quickly be placed on fully-automatic, if and when this is desired.

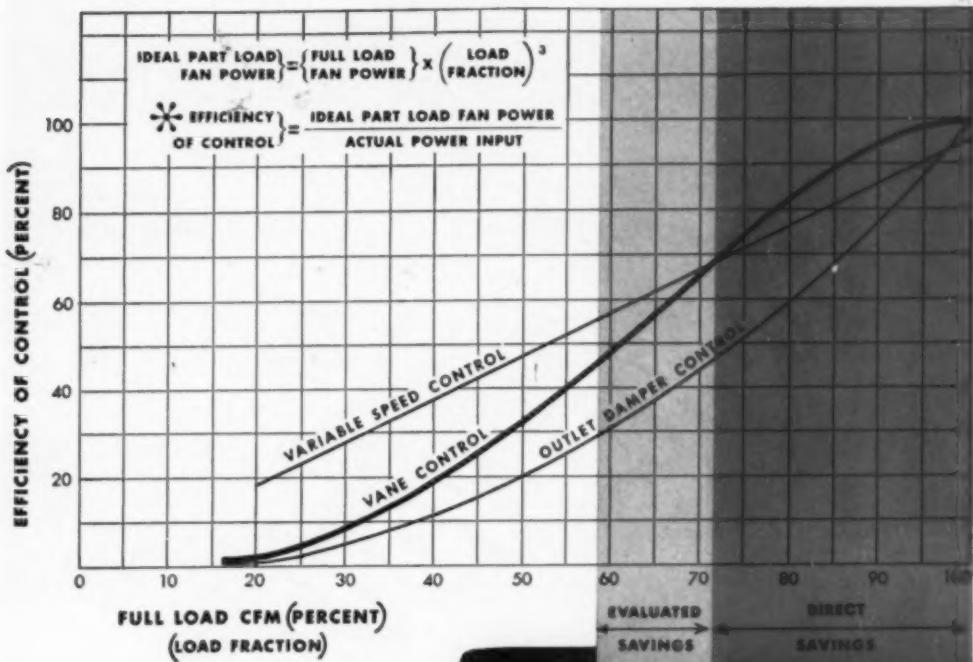


(D) The COPES Balanced Flow Thermostat has steam-flow and water-level elements mounted rigidly on the frame of the water-level element. It is rugged.



FOR PART LOADS

USE STURTEVANT VANE CONTROL®
FOR HIGH EFFICIENCY AT LOW COST



Have you ever considered the relative efficiencies of methods of mechanical draft fan volume control—and then evaluated them against first cost? Do so, and you will find Sturtevant Inlet VANE CONTROL is the best. It is high in *efficiency of control** and low in first cost.

Whether for forced or induced draft, the new VANE CONTROL is a simple and reliable regulator of fan output—a control which responds instantly to varied demands, and yields major power savings at reduced loads.

If you operate in this range—and most plants do—VANE CONTROL is the economical choice

A new Bulletin, DB 92-810, describes the mechanical improvements developed for Sturtevant VANE CONTROL and its use in mechanical draft, industrial and ventilating applications. Write today for a free copy. Westinghouse Electric Corp., Sturtevant Division, 15 Damon St., Hyde Park, Boston 36, Mass.



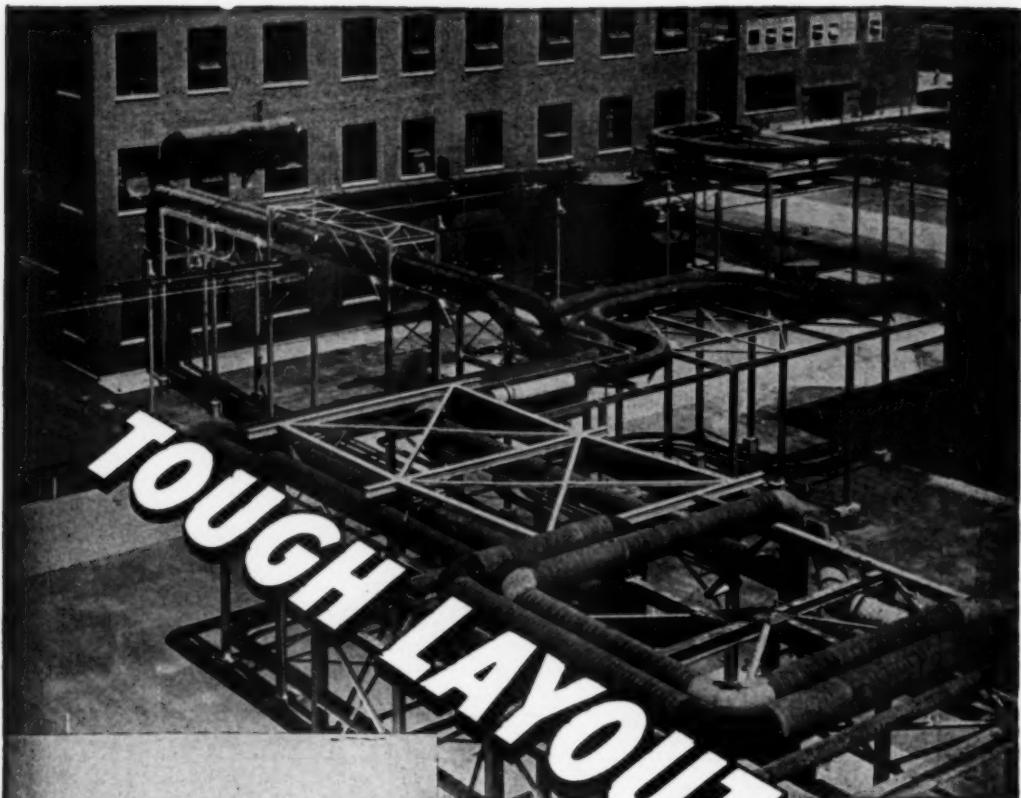
YOU CAN BE SURE...IF IT'S

Westinghouse

PUTTING *Air* TO WORK

J-80220





TOUGH LAYOUTS

- ✓ Assured Safety
- ✓ Efficient Operation
- ✓ Minimum Fuel Costs
- ✓ Low Maintenance
- ✓ Long, Trouble-Free Life



MADE SIMPLE BY NAVCO

The high degree of skill acquired by Navco Engineers from long experience in solving unusual Piping problems is your guarantee of an accurate and workman-like Piping System.

Consult Navco for your next Piping Job



NAVCO PIPING

NATIONAL VALVE & MANUFACTURING COMPANY • PITTSBURGH, PA

NEW YORK • CHICAGO • CLEVELAND • BOSTON • ATLANTA • TULSA • BUFFALO • CINCINNATI

You get practical help
on lubrication and maintenance problems
when the GULF LUBRICATION ENGINEER is



One of the best sources of help on any plant maintenance problem that involves lubricants or lubrication is a trained Gulf Lubrication Engineer.

Gulf Lubrication Engineers are experts in petroleum technology — they are familiar with refining processes, additives, and the past performance records of various types of lubricants. They completely understand the effect of different operating conditions on lubricants. And, just as important, they know the lubrication requirements of all types of plant equipment. The application of this knowledge and experience to each individual problem helps reduce maintenance costs and improve performance.

To get the benefits of this expert engineering service for your equipment, call in a Gulf Lubrication Engineer today. Write, wire, or phone your nearest Gulf office. Gulf Oil Corporation • Gulf Refining Company, Gulf Building, Pittsburgh 30, Pennsylvania.



WHAT ABOUT

Wishful Thinking?

Merely hoping a certain valve will do a required job is not enough. Maybe it will—at first. But if it's not the right valve in every particular—design, construction and materials—"it won't be long!"

There's a Powell Valve specially adapted to each and every flow control service. Why not always be sure with Powell?

Gate, Check, Globe and Y Valves, In
Bronze, Iron, Steel and Corrosion-
Resisting Metals and Alloys



Fig. 11323. Class 1500-pound Cast Steel Pressure Seal Gate Valve with welding ends and electric motor operator. One of many Powell designs for Power Plants.



Quality fine
throughout
"The Line"

POWELL

The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio

Everything you want IN A COMPLETE LINE OF GENERAL SERVICE END SUCTION PUMPS

THEIR APPLICATION IS GENERAL
BUT THEIR RESULTS ARE SPECIFIC

LOW COST: Mass production methods, high volume, modern factory facilities insure a reasonably priced product. Highest quality materials and workmanship, rigid inspection, and proper design insure a superior product at this reasonable price.

SAVE ON SERVICE: Hydraulic characteristics are superior, insuring lowest operating cost over the longest time. Servicing is held to a minimum due to the inherent features of construction, for example: Fractional sizes furnished



standard with mechanical seal; extra wide and deep stuffing box on all integral sizes. Integral sizes available with simple, fool-proof mechanical seal, at slight extra cost.

PEAK PERFORMANCE: The Peerless Fluidyne line was designed with high efficiency in mind. Comparison with

other makes will prove that Peerless furnishes peak performance, size for size. Two types, direct-connected electric drive (Type PE) and V- or flat belt pulley or flexible coupled drive (Type PB), meet every installation requirement.

BROADEST RANGE OF SIZES AND CAPACITIES: Peerless manufactures the complete line of pumps. Available in all sizes and capacities from $\frac{1}{4}$ to 150 h.p., 10 to 5500 gpm, and heads to 260 ft. Most sizes and types carried in factory stock, available either from Indianapolis, Indiana or Los Angeles, California.

The advertisement features a large central title "PEERLESS Fluidyne PUMPS" with "VERSATILE • EFFICIENT • ECONOMICAL" below it. To the left is a "close-coupled electric drive integral HP Type PE" pump, shown in cross-section. To the right is a "V-belt (or flat belt) drive integral HP Type PB" pump, also in cross-section. At the top right is a "close-coupled electric drive fractional HP Type PE" pump, shown from a side-on perspective. Below each pump image is its specific model name and a brief description of its capabilities.

PEERLESS Fluidyne PUMPS
VERSATILE • EFFICIENT • ECONOMICAL

Close-coupled electric drive integral HP Type PE
Capacities: to 1000 gpm; Heads: to 200 ft; up to 60 hp.

V-belt (or flat belt) drive integral HP Type PB
Capacities: to 5500 gpm; Heads: to 260 ft; up to 150 hp.

Close-coupled electric drive fractional HP Type PE
Capacities: to 65 gpm; Heads: to 110 ft; $\frac{1}{4}$ to $\frac{1}{2}$ hp.

NEW BULLETIN describes additional features of pumps in the Peerless Fluidyne line. Write for your copy of this 24-page fully illustrated and descriptive engineering bulletin today.



PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION

Address Inquiries to Factories at:
Los Angeles 31, California or Indianapolis 8, Indiana
Offices: New York, Atlanta, Fresno, Los Angeles, Chicago,
St. Louis, Phoenix; Dallas, Plainview, Lubbock, Texas;
Albuquerque, New Mexico.

MAIL COUPON TODAY

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Los Angeles 31, California

Please send me a copy of Peerless Fluidyne Pump Bulletin No. B-2300.

NAME _____

COMPANY _____

STREET _____

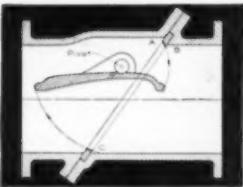
CITY _____

STATE _____



YOU GET

Cushioned Closing
WITH
CHAPMAN
TILTING DISC CHECK VALVES



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

There's no impact on closing — with this valve by Chapman. The balanced disc rides the flow smoothly — uses the fluid or gas itself to cushion the closing action. The disc lifts away from the seat easily on opening; closes quickly, positively—yet quietly.

Consequently, there's no rubbing on the seats—little wear on hinge pins and bearings. Repair needs are at a minimum — maintenance costs low.

Chapman Tilting Disc Check Valves are available in either iron or steel. Write today for catalog with complete technical information.

The Chapman Valve Manufacturing Company
INDIAN ORCHARD, MASSACHUSETTS

Timely Comments



Top Down and Bottom Up—More Than a Job

Put Yourself in Their Place

ONE OF THE greatest stimulants is the feeling of being placed for your whole work life; that you have enlisted for whatever period of work lies ahead of you; until the grim reaper or retirement steps in. The task is to create such a desire in men. That means giving them the maximum possible of the things we would want if in their place.

More men than any of us realize have (it may be subconscious) the feeling that they can contribute to life—make life better for others. The peak is reached when the individual has a deep conviction that his company's moral and social influence extends beyond its corporate activities and that, by reason of this, his job offers him an opportunity to make the world just a little bit better for other people.

These are the thoughts of William B. Given, Jr., chairman of the Board, American Brake Shoe Company. He was discussing Brake Shoe's management set up and experiences before the National Industrial Conference Board.

Competent Men Missing

After he became president in 1929, Mr. Given's job was developing management people. They needed more capable men in all ranks. Compensation was good but something was missing—Why the shortage?

Analysis showed the following: too many men who did not rate the confidence of men under them; too little delegation of authority; too little indication of human interest in individuals; too seldom any idea by the men of how they stood with the bosses; too many men feeling they were grooved into a small area; too few team players; too much personal criticism; and warranted praise too seldom given.

Move Them Out

Everyone knows what kind of a man he wants for his own boss. Obviously, placing that kind in all places of importance is the objective. This meant important replacements at American Brake Shoe. Mr. Given emphasized that the removal from executive places of each and every one who is not the kind of man you would enjoy working under, is essential.

Stimulant number one is having the right kind of human beings in all positions. As the offenders are moved aside or out, stimulation to others is immediately apparent. Failure to move them out can't be

offset by inflated salaries or glorious plans for the others.

Realization by the individual that his good performance will be recognized, is mighty important. American Brake Shoe managers give their own people the benefit of advancement as openings occur. Unless there is no one who can possibly qualify, it is not fair to the company people to hire an outsider merely because he successfully held a high place in another company. Bringing in outsiders for key jobs takes the most exciting element out of working for a company and often cancels the effect of money advancement.

One of the greatest stimulants to employees in any company comes with a conviction that it is company policy to gamble on its own people, even if from the standpoint of their experience the odds are bad. Often this costs money short range, but consistently following the policy is profitable.

Too Many Men Are Lost

Good men want frank criticism and are resentful when it is not given. Too many, for great periods, feel lost and forgotten. People under us should have first call on our time. Yes! and when they feel you are always available, the good ones never waste your time.

Pride in company people, respect for the seniors as people and as executives and also for the quality of company product, will hold and stimulate to a degree that cash advances never can. Men want a top man whose all out pride is in building a better company. They quickly spot the "top" who is trying only to build his own fame and riches. Promotions based only on a man's knowledge and skill are costly.

More Than Cash

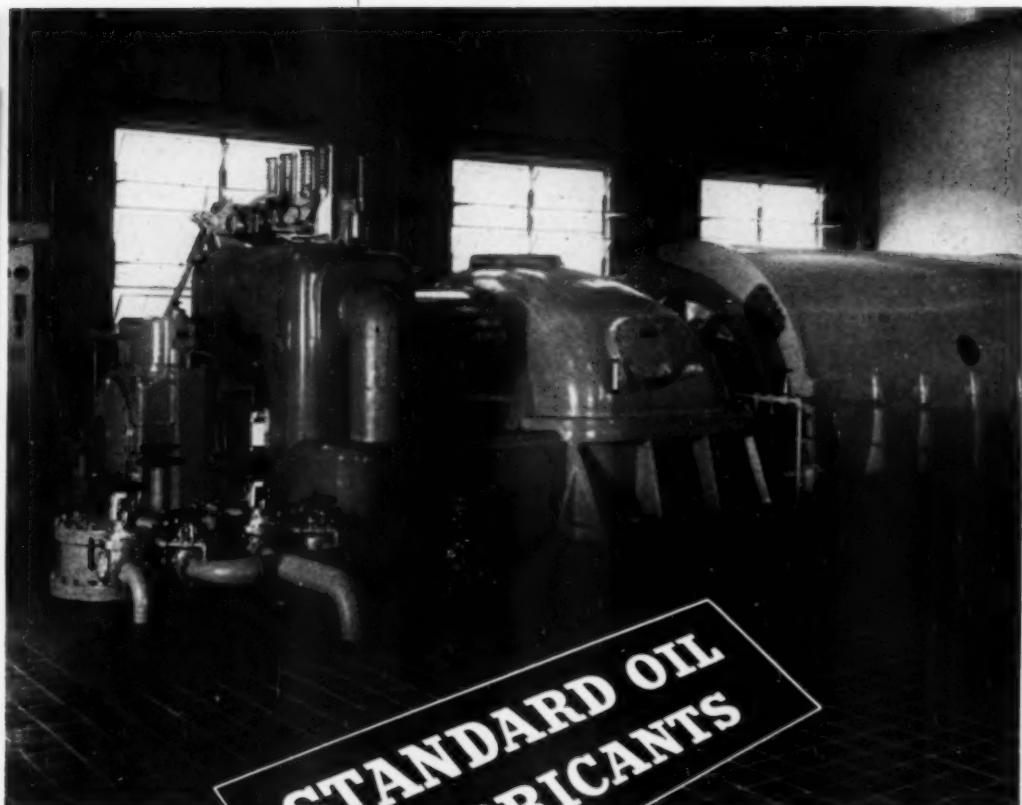
Generally, the man who leaves one company to go to another has, among other reasons, a cash incentive, but in Mr. Given's opinion, few leave solely on account of the cash. Within limits, and this varies with individuals, a man who says "no" to an outside offer does so because he likes the people he works with and the boss' interest in him. He likes the company's prospects and standing and the degree of his own authority. He likes the feeling that men under him are loyal, and the seniors' availability. He expects the top men of his company to deserve the confidence of their people, and he wants them to exhibit a willingness to go to bat and fight for their people in case of emergency.

The best turbine oils are those that free themselves of air and water, resist oxidation and rust, and eliminate sludge and gum tendencies. Standard Oil turbine oils have been famous for these *very* qualities for many years. They have shown little or no trace of oxidation after years of service in industrial, public utility and marine installations, often far

surpassing the performance record of the oils which they replaced. They are refined by the most modern methods, from carefully selected crudes, assuring the highest

possible resistance to oxidation, rusting and foaming. For dependable turbine lubrication, consult one of our representatives. Remember—the combined facilities for research, testing and engineering behind the line of industrial lubricants he offers, are *unequalled*.

minus air and water



STANDARD

OIL COMPANY (KENTUCKY)

Industry Speaks

An Appraisal of Business Conditions

Adapted from comments by **Mr. Horace Zimmer**, Manager of Districts, **General Electric Company**, before the Southwestern Industrial Power Application Conference at Dallas, Texas, June 27th. On-the-spot report of the G.E. conference is featured in this issue.

GENERALLY speaking, the business outlook is encouraging. According to our Market Research Division, we can expect a high level of activity in terms of both dollars and volume of production. Peak will occur somewhere around late '52 or early '53, coinciding with the peak in defense production. After 1953, as military expenditures are reduced, I suspect there will be a few dips on the business horizon. But, we don't expect business to drop below the 1949 levels.

These forecasts mean that the electrical industry has been challenged once again to provide power for a rapidly expanding economy, for an augmented industry and for an increased industrial population.

Southwest Boom

Right here in the Southwest area alone, the peak load has increased 311 per cent over a period of ten years, or 90 per cent over the average growth of peak load in the entire nation. Moreover, you're doing over 3 1/3 times the amount of business you did in 1941 which is more than the ratio of the entire country's 2.7 index.

Then, this is not the time for business as usual. It is not the time for complacency. It is rather a time of improvement and production.

What's Ahead

What are some particularizations on business conditions which the electrical industry will face within the next five years? What will be our military expenditures, our industrial production? What activity can we expect in producers equipment, military durables, and consumer durables?

As part of our government's two point program, military expenditures will rise sharply from 14 billion in 1950 to a peak of 64 billions in 1953. From 1953 it will taper off to about 40 billions.

This is not a wild hysterical mobilization of our manpower into a rigid wartime economy, but a carefully balanced job of building our military. It is based on neither appeasement nor spreading the war. In the event of another world free-for-all ensues, these programs give way to military expenditures of about 200 billion a year.

Our industrial production, according to the latest figures from the Federal Reserve Board Index, will go from 200 in 1950 to about 254 in 1953. After the peak in

military expenditures in '53 our Market Research feels that the index will drop off to 197 in 1955.

Actually, 1955 is pretty far off, so this is really a guesstimate. Many factors and conditions could interpose themselves between now and then, changing the business complexion appreciably.

Durable Goods Index

Another significant indication of business conditions is the durable goods index. According to the latest figures, we expect this index to rise from 237 in 1950 to a high of 346 in the peak year of '53.

Since the first part of the defense program is to build up our basic productivity, the first demand in the new economy will be for producer's equipment. This includes a lot of plant, mining, construction machinery and railroad equipment. We expect 1951 will be the biggest year of all for these producer items, but from 1953 on the sales begin to slacken. The index for producer's equipment drops below the level of the previous three years and it becomes apparent that there's got to be a lot of selling in the industrial fields for possible lean years ahead.

The Buildup

The big year for the military durables, the planes, the tanks, the guns, will be in 1953. Notice if you will, the spectacular buildup that is gradually affected. We don't toss ten million men into the army and then build the weapons. We made that mistake in 1940 and had our men playing around with broom sticks and papier-mâché cannons.

But gradually, almost imperceptibly, the ponderous productive machinery of America begins to roll, strengthening our defenses slowly, surely, until it has built a periphery of steel, fortified externally with a strong military, and internally with a strong civilian economy.

The Job Ahead

Emotionalism would have us thinking that we are in an all out effort now, that our very existence as a free nation depends on building a mighty military at any expense. Well, I think the destruction of the American economy is too great an expense to pay for mock heroic attitudes. Such an approach to our national defense has no part in balanced thinking. It distorts our viewpoints and throws our business judgment out of balance. It straps our industry to the production of munitions and the implements of waste, and never gives a thought to our normal peacetime pursuits.

Our job today is to strengthen our civilian economy, not to bury it, and the problem becomes more difficult when we realize that we must pile the military demands on top. Naturally such a task means more work for us all, and this is especially so in the electrical industry, for we will be called upon to provide power for both.

Editor's Note: See also our staff report of the Industrial Power Application Conference on page 58.

Oil and Gas Power Conference

ASME—Dallas, Texas—June 25-29, 1951

D. A. Hulcy, President, Lone Star Gas Co., Dallas, Texas, and President, U. S. Chamber of Commerce, speaks at the Welcome Luncheon. At his side is Carl J. Eckhardt, Vice-President, Region VIII ASME, and Professor of Mechanical Engineering, University of Texas, who served as chairman of the meeting. T. M. Robie, Chairman of the Oil & Gas Power Division is seated next to Professor Eckhardt. Mr. Robie is with Fairbanks, Morse & Co., Beloit, Wis.



DESIGNERS, operators and sales engineers — all with their thoughts focused on better performance—held their annual clearing house on new developments at Dallas, June 25-29. As always, this, the twenty-third annual conference of the Oil and Gas Power Division of American Society of Mechanical Engineers, was well attended and brought forth many serviceable

papers that will be of continuing interest to power men in this field.

The five-day conference included eighteen technical papers, a manufacturers' equipment exhibit, and an all-day inspection trip (travel by plane) to the Halliburton Cement Company plant at Corpus Christi; and the Aluminum Company of America's new plant at Point Comfort.

The first morning of the meeting included registration, and with Stuart Nixon of Sealed Power Corporation presiding, Ralph Miller, Chief Engineer, Four Cycle Diesel Engine Division, Nordberg Mfg. Co., presented a technical paper: *The Effect of Charge Temperature and Pressure on Rating of Diesel Engines and a Variable Compression Ratio Supercharging System for 2 and 4 Cycle Internal Combustion Engines*.

This paper was followed by the Welcome Luncheon, presided over by C. J. Eckhardt, Vice-President, Region VIII, ASME and Professor of Mech. Engrg., University of Texas, Austin, Texas. The principal speaker was D. A. Hulcy, President, Lone Star Gas Co., Dallas, Texas, and President, United States Chamber of Commerce.



Brian P. Emerson, Secretary of Oil & Gas Power Division, Edgar J. Kates, Treasurer, and T. M. Robie, President, were made honorary Texans, and were presented with appropriate gifts and a certificate of honorary citizenship from the governor. Carl J. Eckhardt, right, made the presentations.



Herb J. Williams, Carthage Water & Electric Plant, Carthage, Mo., and Glen C. Boyer, Frank Horton & Co.



F. L. Schmale, Double Seal Ring Co., Ft. Worth, Texas and R. W. Hoyt, Double Seal Ring Co., Ft. Worth, Texas.

The afternoon session on June 25 was presided over by E. J. Kates, Consulting Engr., Diesel Specialist, New York, N. Y., and included two technical papers: *Damage Prevention from Diesel Engine Crankcase Explosions*, by A. C. Cavillear, Head of Large Diesel Engines Branch, Internal Combustion Engine Lab., U. S. Naval Engrg. Experiment Station, Annapolis, Md., and *Diesel Engine Crankcase Explosion Investigation*, by G. W. Ferguson, The Texas Company, New York, N. Y.

Lectures

The two OGP lectures for this meeting were presented on the morning of the 26th. G. Forrest Drake, Manager of Engrg., Woodward Governor Company, Rockford, Ill., discussed the basic require-

ments of *Internal Combustion Engine Governing*; and Charles Concordia, Analytical Div., General Electric Co., Schenectady, N. Y., talked on the subject of *Parallel Operation of Generating Sets*.

A barbecue and hoe down on the evening of the 25th concluded the first day activities.

Session III

The engine operator's viewpoint, as interpreted by four experts with long service, was presented in a panel discussion of four topics, with H. L. Kent, Jr., Associate Professor of Mechanical Engineering, University of Texas, as moderator.

Patrick Schlesinger, superintendent, Ponca City (Oklahoma) municipal water and light department,

depicted the growth of his plant from an initial valuation of \$30,000 in 1912 to \$1,250,000 today. At present the plant, he stated, was showing a profit of half a million dollars annually, and was providing all the revenue necessary to operate the city government.

The diesel plant uses centrifuge 8 to 10-gravity fuel at a cost of approximately \$100,000 a year. With 10-gravity fuel costing 5¢ per gallon, and producing 11 kwh per gallon, the plant fuel bill was \$454 per day. On dual fuel, the daily gas bill ran \$145.50 plus fuel oil \$27.20, for a \$172.20 total—a saving of \$281.80 per day.

He stressed the importance of accurate and complete engine logs, and outlined the system of progressive overhaul used, in which the

Tom D. Sandlin, Interstate Oil Pipe Line Co., Tulsa, Okla.; O. Paul Doyle, DeLaval Separators Co., Tulsa, Okla.; and George Elston, Hilliard Corp., Tulsa, Okla.

John R. Leonard, Magnolia Petroleum Co., Dallas, Texas; C. P. Byrne, Beaumont Iron Works, Beaumont, Texas; and A. Y. Gunter, American Locomotive Co., Houston, Texas



operators make no repairs, all such work being done by the maintenance crew.

D. E. White, Superintendent of Maintenance, **Magnolia Pipe Line Company**, Dallas, outlined fuel preparation for pipeline station power use. Natural gas needs only to be cleaned of dust and foreign particles and stripped of water and entrained liquid hydrocarbons before being usable where the gas is sweet. When using sour gas—gas with hydrogen sulfide content—he recommended operation of the unit at jacket water temperatures of 220 F, to minimize condensation of water vapors formed during the combustion cycle. Use of amines as absorbents of the H₂S gas was advocated where engine size or station fuel demand justifies the installation of a packaged unit for this purpose.

When burning crude from the line throughput, adequate cleaning requires initial settling, filtering, heating to 100 F or above dependent on charring and other crude oil characteristics, and then centrifuging before storing as cleaned fuel. The elevated temperature is desirable to insure complete solution of paraffin or other wax-forming constituents of the crude. The stored fuel is then checked by shake-out before being admitted to station day tanks.

Tom Moore, Municipal Power Plant, Freeport, N. Y.; **W. J. Fritton**, Van Der Horst Corp. of America, Olean, N. Y.; **George H. Bollman, Jr.**, Clark Bros. Co., Olean, N. Y., and **C. A. Chamberlain**, Clark Bros Co., Olean, N. Y.



O. H. Moore, Director, Engineering Research, **Tennessee Gas Transmission Company**, Houston, discussed water treating problems as encountered in the company's trunkline system. He stated that the amount of make-up water at some stations equalled daily the volume of water in the cooling tower basin, thus indicating a concentration by evaporation of solids in the range of plus 1 per day. After utilizing the service of two water-treating specialists, the company completed organization of its own engineers for this work, and now places a water-treating engineer at each station, where he can keep daily check on water conditions and maintain the desired flow.

He outlined the four point program which they are following: (1) delignification; (2) corrosion; (3) scaling; and (4) fouling. In this connection he stated that the company was going to the use of closed systems wherever possible. He also described the use of special marine anti-fouling paints as a means for controlling algae development in open towers.

W. A. Rachrig, Master Mechanic, **Humble Pipe Line Company**, Houston, detailed the various steps taken in engine maintenance and periodic overhaul. He stressed the necessity for accurate, complete records, pointing out their value in

scheduling operations when pipeline runs are overloaded. He stated that the overhaul period averages 1 to 1½ years' interval for engines (diesel) operating on sour crude, as against 2 to 3 years on sweet crude.

He advocated the enclosed water system as tending toward scale elimination, and also stated that it was his company's practice to renew all gears of a system when it became necessary to replace one of the train. He also advised extreme care to see that no hands touched a lapped surface.

After an overhaul he stated that the engine was barreled over through several cycles and then operated at no load for fifteen minutes; then shut down and checked. A second no load run, this of 30 minutes' duration, was then made and a second thorough check made. If no trouble was indicated, the engine was then considered ready for service.

Session IV

With George Steven, Executive Engineer, Worthington Pump & Machinery Corporation, Buffalo, as moderator, *Engine Operation and Maintenance from the Manufacturers' Viewpoint* was discussed by a panel including James Caldwell, Engineer, Cooper-Bessemer Corporation, Mt. Vernon, Ohio; H. G. Braendel, Chief Engineer, Wilkening Manufacturing Company, Philadelphia; Robert Cramer, Jr., Assistant Chief Engineer, Nordberg Manufacturing Company, Rockford, Illinois; G. Forrest Drake, Chief Engineer, Woodward Governor Company, Rockford, Ill.; Hans Hogeman, Chief Engineer, American Bosch Corporation, Springfield, Mass.; and A. J. Poole, Sr., Sales Manager, Bendix-Scintilla, Sidney, N. Y.

The subjects discussed ranged from bearing clearances and bearing troubles, lube oil pressures and means of determining when such pressures were inadequate, through the commoner types of indicators which might be relied upon to let the operator know when the engine required maintenance, or whether overhaul was required.

Wrist-pin and crank bearings were compared for 2 and 4 cycle engines, with recommendations for

their maintenance, including the replacement of pins. It was emphasized that replacement after a specified number of operating hours was not always necessary, but that replacement should be made obligatory in event of a piston sticking or a bearing seizing.

The relative merits of wide and narrow piston rings, the number of rings required, and other details of ring and liner wear were considered, with the bulk of the comments definitely indicating the trend toward the narrow rings and even the shaped or relieved face type of ring to obtain better oil-film sealing.

Fuel injection equipment, governors and ignition systems were each touched upon in a series of questions which brought out the attitude of the industry toward such details as cooling of nozzles, practicability of switch from battery to magneto ignition, or the reverse,

without revamping the coil and distribution accessories, and the desirability of providing hydraulic type governing mechanisms with oil which might—and usually did—vary widely in physical characteristics from the oil being used in the engine over which the governor maintained control.

Sessions V and VI

The entire day of the 26th was given to four important papers. The morning Session V was presided over by O. H. Moore, Director, Engrg. Research, Tennessee Gas Transmission Co., Houston, Texas, and the afternoon Session VI was handled by Hans Bohuslav, Chief Engr., Engine Construction, R. G. LeTourneau, Inc., Longview, Texas, as chairman.

The papers were: *The Modern Gas Engine*, by R. L. Boyer, Vice-President and Chief Engr., Cooper-

Bessemer Corp., Mt. Vernon, Ohio; and W. R. Crooks, Resident Engr., Cooper-Bessemer Corp., Grove City, Pa. *Operation of A Direct Connected Engine Driven Compressor as A Gas Generator*, by J. N. MacKendrick, Vice-President, George Bollman, Project Engr., and C. A. Chamberlain, Project Engr., Clark Bros. Co., Inc., Olean, N. Y. *Design of Exhaust Snubber for the Gas Engine*, by R. L. Leadbetter, Vice-President, Burgess-Manning Co., Dallas, Texas. *Water Cooling Equipment for Diesel and Gas Engines*, by H. E. Degler, Technical Director, The Marley Company, Kansas City, Kansas.

Inspection Trips

The final day of the meeting was given over to inspection trips. In addition to the airplane trips mentioned earlier, another group of visitors saw the Magnolia Research Laboratory at Dallas.

Mass Handling with Fork Trucks

**Unloading costs cut 70% . . .
demurrage charges and costly
overtime eliminated . . . crews
freed for stock maintenance.**

MATERIALS handling at the huge Weingarten warehouse in Houston involves unloading 2,100 incoming freight cars annually, moving merchandise to storage areas, daily transporting to assembly lines and constant moving to shipping docks.

Fast turnover is important. Yet much of the material handled is bulky, lightweight merchandise (note this view of 120 light but bulky cartons of cereal products being placed in surplus storage in a single movement). Thus it must be moved swiftly from freight car to storage to assembly, thence to huge waiting vans.

Six Towmotor fork lift trucks are doing the job and effecting marked savings for the Weingarten firm which operates twenty-five retail food markets in the Houston area.—Courtesy Towmotor Corporation, Cleveland, Ohio.

Houston's J. Weingarten, Inc., is one of the largest food distributors in Texas. Here is the interior of their main warehouse which contains approximately 122,000 sq ft on one level with a basement of approximately 50,000 sq ft. Without the use of fork lift trucks, it would be impossible to create such a space-saving concentration of merchandise, and cost of handling would be prohibitive. In some sections, 45 degree angle stacking is maintained to permit greater facility of lift truck movement and expedite identification and selection.



Another Extension for Bayboro

A special extraction turbine equipped with a condenser and special governors serves as a reducer controlling extraction steam to the low pressure units, and can also operate straight condensing.

By R. B. LEE
Production Engineer
Florida Power Corporation
St. Petersburg, Florida

THE Bayboro Plant of the Florida Power Corporation, located at St. Petersburg, Florida, prior to recent additions consisted of three low pressure boilers, one 6000 kw and one 12,500 kw turbo-generators, two high pressure boilers, and one 25,000 kw turbo-generator. While the two low pressure turbines were in fairly good condition, the low pressure boilers generating steam at 300 psig and 600 F total temperature were not dependable. They were approximately 24 years old and had been subjected to both frequent shutdowns during low demand periods and lengthy maximum overloads during winter high load periods.

A pressure reducing and desuperheating station had been installed with the high pressure turbine to supply steam to the low pressure system from the boilers operating at 860 psig and 900 F total temperature. Since these boilers would only generate 350,000 lb per hour and the high pressure turbine required 330,000 lb per hour at maximum output, very little steam could be supplied to the low pressure system through this reducing station when it was needed most.

Equipment Studies

It was decided to install another boiler to generate steam at 860 psig and 900 F total temperature, and increased the capacity of the pressure reducing and desuperheating station so that it would supply the steam demand of the low pressure turbines — leaving the low pressure boilers for emer-

gency operation only. This would result in considerable savings since the new boiler would operate at approximately 86 per cent boiler efficiency while the low pressure boilers operated at 71-72 per cent.

Furthermore, since there is a loss of energy through a reducing station, consideration was given to the installation of either a topping or extraction unit. A topping unit would require the operation of some of the low pressure equipment at all times while a standard extraction unit would introduce the loss of the grid valve for controlled extraction and limit the amount of extraction to provide the minimum amount of cooling steam to the low stages.

A proposition was received on a unit that would control the extraction steam pressure to the low pressure units by positioning a pressure controlled governor on the steam to the unit. This would provide a practically constant amount of steam to the lower stages. It could also be operated straight condensing.

This arrangement seemed most desirable, since it would provide extremely flexible operation. Therefore it was decided to install a 10,000 kw unit with condenser and a 330,000 lb per hour boiler operating at 860 psig and 900 F total temperature.

New Boiler

The boiler is of the integral furnace type with hopper bottom furnace and complete water walls, fired by 6 steam atomizing fuel oil burners. Since slagging trouble

had been previously experienced, the pendent superheater was designed with 2-in. minimum spacing between tubes.

Building limitations required that the air heater be located on the roof. Since a tubular heater would require considerable bracing due to the large surface exposed to occasional winds of hurricane force, 2 Ljungstrom pre-heaters were installed. Two forced and two induced draft fans were chosen, each set with a capacity equivalent to 60 per cent boiler output.

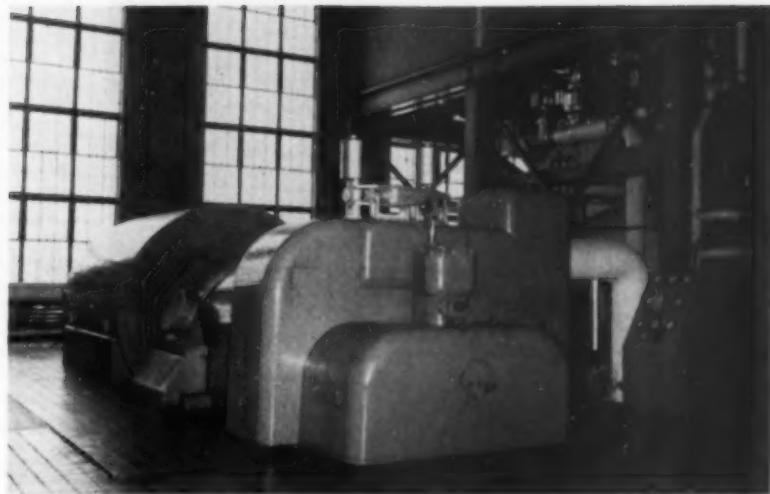
Experience on other high pressure boilers indicated that air should be used as the blowing medium on all air heaters when burning fuel oil. Steam had been found to be best on the superheater and boiler surfaces, however, because of its unlimited supply, while with air, capacity would depend on the size of compressors and receiver.

Automatic sequential soot blowing equipment was installed, using air only on the air preheaters. This resulted in small compressors and receiver being required, and allowed the system to be operated at 350 psig instead of 500 psig.

Steam temperature is controlled by bypassing part of the partially superheated steam through coils in the mud drum. The control range starts at approximately 225,000 lb per hour output.

The boiler was equipped with complete automatic combustion control, 3 element feedwater control and steam temperature control. The boiler panel was located in line with the existing high

Turbo - generator showing auxiliary panel with a speed recorder, pressure gages, and thermometers on extraction heaters.



pressure boiler panels with the sequential soot blower panel nearby. One operator can control or supervise the entire boiler operation under normal conditions with some assistance during burner changing and cleaning.

The piping and controls were arranged so that the new boiler and unit can be operated as a unit and separated from the other high pressure system. Due to extra capacity in this boiler and the added safety provided by all boilers dividing load variations, normal op-

eration is to supply all steam to a common header.

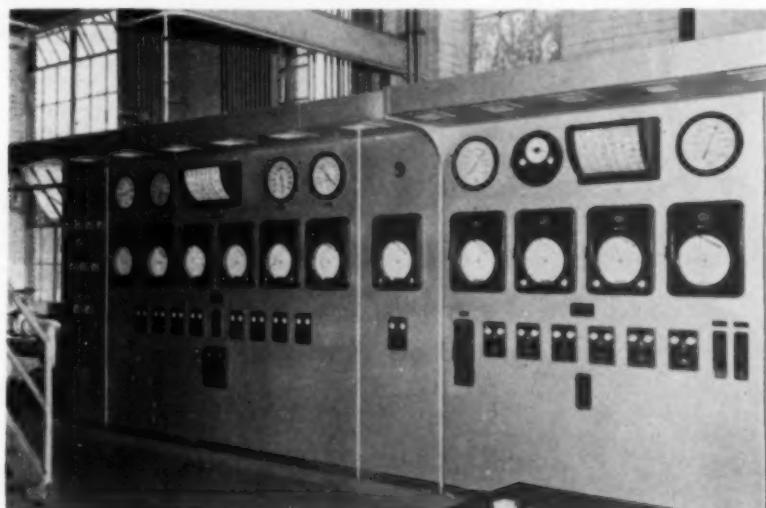
New Turbo Generator

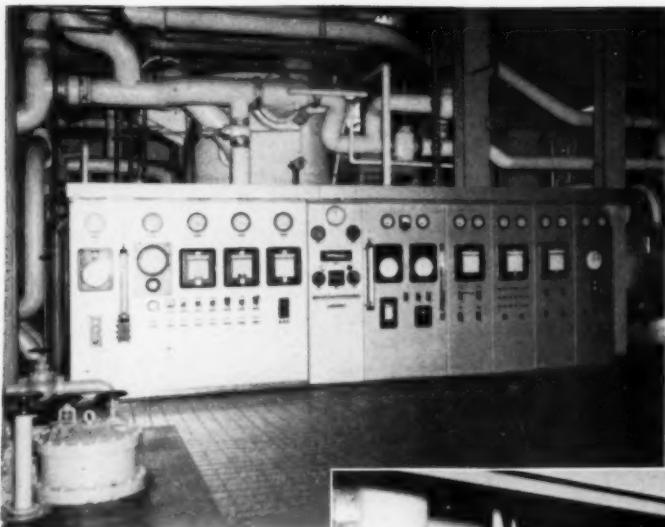
The new turbine-generator has a nameplate rating of 10,000 kw at 80 per cent power factor when operating at 2 in. mercury back pressure and supplied with steam at 805 psig 900 F total temperature. Steam to the low pressure turbine is extracted at the 3rd stage and a desuperheating station is required on this steam to limit the temperature to 600 F.

There are two closed feedwater heaters taking heating steam from the 3rd to 7th stages and an open deaerating heater normally operated on the 10th stage. It is necessary to load the unit to approximately 6700 kw before the 3rd stage pressure is 300 psig, at which load the low pressure units can be brought into service.

As long as it is not necessary to maintain 300 psig on the 3rd stage, that is below 6700 kw, or when the unit is operated straight condensing except for feedwater

Boiler control panels. Panel for new boiler on left end showing separate panel for ammeters and control switches. Panel for one of old boilers is shown at right.

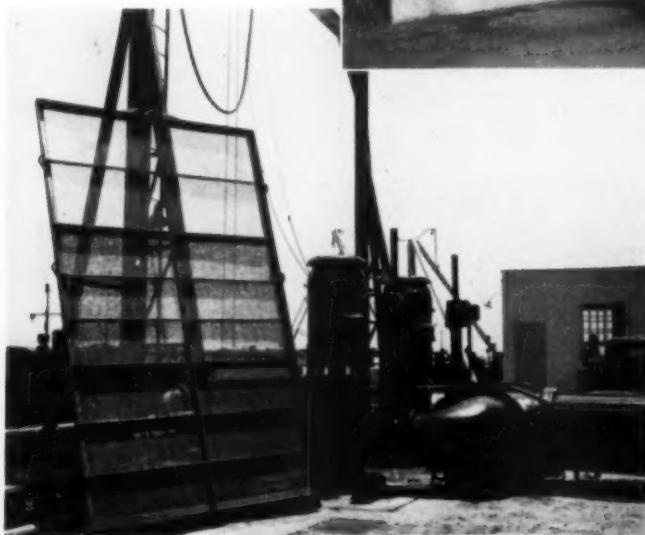
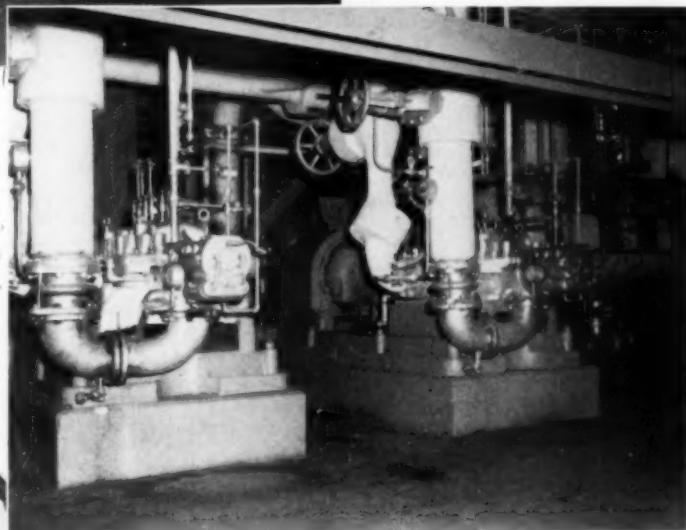




Turbine panel board with instruments for new unit #4 on left end, instruments for unit #3 in middle, and steam pressure reducing and desuperheating station on right end.

Two of the three feedwater pumps installed with the new boiler.

Vertical circulating water pumps for new unit with one of the straight screens.



heating, a speed governor controls the steam input. As soon as steam is supplied to the low pressure turbines, a pressure governor operated from 3rd stage extraction pressure is used, and the speed governor is cut out. The load on this unit then depends on the output of the low pressure units.

Since the units in this plant operate tied in with the utility system, speed is automatically controlled unless some serious fault separates the various plants. In order to guard against this unit tripping out on overspeed under this condition, a secondary governor will limit the speed when

the frequency increases to 62 cycles.

Condenser

The condenser was designed for maximum flow with no extraction and equipped with two vertical propeller type pumps. Normal operation is with extraction to low pressure turbines, under which condition only one pump is required.

This plant uses salt water from Tampa Bay for cooling water to condensers. Since this could not be used in the oil coolers and generator air coolers, a closed system with heat exchangers was in-

stalled. Some installations use condensate from condensers for this purpose, but such design presents possibility of oil contamination. Furthermore, during the summer, the temperature of the circulating water at this plant is so high that the temperature of the condensate after the inter and after condensers is 115 F or higher. It has not been possible to obtain good water from a well, so city water for makeup must be used. There are two heat exchangers, each with 60 per cent of required capacity. The closed generator cooling system is kept full of water with a tank connected to the suction of the pumps. Condensate is used, and the pH

is maintained at approximately 8.6.

Since normal operation requires only one circulating pump, straight screens instead of traveling screens were installed. Electrolysis and the corrosive qualities of the circulating water indicated that the standard design of iron frames and bronze wire was not satisfactory, so both the frame and wire of the four screens are stainless steel. The circulating pumps are located in separate intake wells, allowing the cleaning of either one with shutting down the unit.

Feedwater Supply

Three feedwater pumps were installed, each with a capacity

equivalent to 60 per cent boiler output. The piping from these pumps was arranged so that they could be used on any of the three high pressure boilers; this tie-in permitted the use of the existing pumps on the new boiler.

It was desirable to be able to use any feedwater pump on any boiler, but two deaerating heaters were required and this presented a problem. This was solved by the installation of a second float-operated surge tank on the roof with an equalizing line between it and the existing one for the other high pressure unit. The level in the deaerators is maintained by float operated valves and turbine condensate returns go to the surge

PRINCIPAL EQUIPMENT—Bayboro Extension, Florida Power Corporation

GENERAL DATA

Name of Station	Bayboro Steam Plant, Florida
Power Corporation	
Station Site	St. Petersburg, Florida
Steam Conditions	860 and 390 psig, 900 F and 600 F
Cooling Water Source	Tampa Bay
Design and Construction	Kuljian Corporation

TURBINE-GENERATORS

Turbine	One—Westinghouse Electric Corp., 12,500 kw, 3600 rpm, 850 psig, 900 F
Generator	One—Westinghouse Electric Corp., 3600 rpm, 10,000 kw, 12,500 kva, 666 amp, 11,000 v.
Exciter	One—Westinghouse Electric Corp., 65 kw, 3600 rpm, 250 v. direct connected
Generator	One—Westinghouse Electric Corp., 2 stage, 1000 kw, 3600 rpm, 12,500 kva, 666 amp, 11,000 v.
Turbine Oil Cooler	One—Westinghouse Electric Corp., surface, 4090 sq ft cooling surface, 216 gpm cooling water
Turbine Oil Coolers	Two—Westinghouse Electric Corp., 250 sq ft, require 184 gpm water
Turbine Oil Filters	One—Bowser, Type 522 P, 135 gph to 270 gph

CONDENSING EQUIPMENT

Surface Condenser	One—Westinghouse Electric Corp., 10,000 sq ft aluminum brass tubes $\frac{1}{2}$ " OD x 18 BWG x 24"-6" lg, divided single pass
Circulating Pump	Two—Westinghouse Electric Corp., propeller, 10,900 gpm each, motor driven
Condensate Pump	Two—Westinghouse Electric Corp., 2 stage horizontal, centrifugal—250 gpm, motor driven
Air Removal Pumps	Two—Westinghouse Electric Corp., multistage
Priming Ejector	One—Westinghouse Electric Corp.

STEAM GENERATING EQUIPMENT

Boller	One—Babcock & Wilcox Co., integral furnace, 21,934 sq ft, 235,000 lb per hr maximum, 300,000 lb per hr normal, 1600 psig design, 850 psig operating; drums—steam, 60"x43"-8%" lg; mud, 42"x42"-3" lg
Superheater	One—Babcock & Wilcox Co., pendant, 910 F
Furnace	Babcock & Wilcox Co., tube to tube water walls, hopper bottom
Air Heaters	Two—Ljungstrom, 36,100 sq ft; air temp—inlet, 80 F average; outlet, 520 F
Soot Blowers	Diamond Power Specialty Co., automatic air sequential—steam on superheater and boiler, air on air heaters
Blow-Off Valves	Six—Yarway, Figure 3981—3957— $\frac{1}{2}$ "
Water Columns	One—Diamond HI & LO Alarm Co.
Safety Valves	Three—Consolidated 1557 HRA—3" One—Consolidated 1557 HR-D—4"

FUEL BURNING EQUIPMENT

Burners	Six—Babcock & Wilcox Co., Y jet steam atomizing oil burners
Combustion Control	Bailey Meter Co., pneumatic
Fuel Oil Pumps	One—Quimby, 50 gpm at 250 psig
Fuel Oil Heaters	One—Griscom Russell, #15—6—90 Style B, 29,850 lb per hr, 300 psi

DRAFT EQUIPMENT

Stacks	White Construction Co., St. Petersburg, Fla., steel, dia 18"-6" to 12"-6"; height 142"-6"
Smoke Breeching	Coastal Steel Co., St. Petersburg, Fla.

Forced Draft Fans	Two—American Blower—Sirocco, test block 240,000 cfm at 145 F and 9.6" static; drive—250 hp motor 870 rpm—2300 v.
Induced Draft Fans	Two—American Blower—Sirocco, test block 267,000 cfm at 215 F and 9.4" static; drive—250 hp motor 875 rpm—2300 v.
Air Ducts	Babcock & Wilcox Co.
Draft Gages	One—Bailey Meter Co.
Draft Controls	Four—Bailey Meter Co., pneumatic

BOILER FEEDWATER EQUIPMENT

Boiler Feed Pumps	Three—Pennsylvania, OMS—7 stage Thrustre centrifugal, 419 gpm, 2660 ft head, 2500 rpm, 450 hp motor—2300 v.
Bleeder Heaters	Two—Griscom Russell, turbine extraction, vertical, 326,240 lb per hr; #1—314 lb abs; #2—36 lb abs; tubes—30—20 copper-nickel forged steel shell.
Deaerating Heaters	One—Cochrane Corp., tray type, 350,000 lb per hr
Feedwater Regulators	One—Bailey Meter Co., 3 element pneumatic
Evaporator	One—American Locomotive Co., 7000 lb per hr, single effect, horizontal, flex tube with integral deaerating heater
Water Softening Plant	One—Permitut, zeolite

PIPE AND PIPE COVERING

Piping Contractor	National Valve
Steam Header	10"
Pressure-Reducing Valves	Republic, and Fisher
Float Chambers and Floats	Fisher
Drainage on Feedwater Heaters	Washed float operated lever valves
Pipe Covering Contractor	Brooks-Fisher
Pipe Covering Material	Johns-Manville

INSTRUMENTS

Steam Flow Meters	One—Republic
Boiler Meters	One—Bailey Meter Co.
Feedwater Flow Meters	One—Bailey Meter Co., mechanical
Draft Gages	One—Bailey Meter Co., Diaphragm Pressure Gages:
Indicating Recording	Ashcroft
Mercury Columns	Bailey Meter Co.
Thermometers:	American
Indicating Recording	American
Condensate Conductivity Recorder	Bailey Meter Co.
	Leeds & Northrup

ELECTRICAL EQUIPMENT

Switchyard Structure	Robbinc Electric Co.
Main Transformers	One—Westinghouse Electric Corp.
Auxiliary Transformers	One—Westinghouse Electric Corp.
Switchboards and Equipment	Westinghouse Electric Corp.
Oil Circuit Breakers and Disconnect Switches	Westinghouse Electric Corp.

MISCELLANEOUS

House Service Pump	One—Fairbanks-Morse
Desuperheating Water Pump	One—Pennsylvania
Air Compressors	Two—Pennsylvania, 2 stages, tank dem, horizontal 102 cfm free air at 350 psig, motor driven
Major Drive Couplings	Fast
Concrete Foundations	and Concrete Water Boxes
	Raymond Concrete Pile Co.

tanks or deaerators as required. The tie-in on the high pressure feedwater was made beyond the high pressure heaters so that the unit in service would heat its feedwater by extraction.

The turbine panel board was located beside the existing panel board so that one operator could supervise operation. Necessary thermometers and gages for obtaining data for heat balance calculations were installed, but a

test setup of thermocouples was also made using a portable potentiometer for periodic checks.

Operating Experience

It was expected that some difficulty would be experienced in operation, due to the seeming complicity of the system. After the first three or four months, no trouble is experienced by the operators in making any required change. The added flexibility of

interconnecting steam, feedwater, and condensate has made it possible to shut down any boiler or turbine without requiring the outage of other equipment. It is also possible to shut down the low pressure turbines during the low load demands and still operate both high pressure units. When the low pressure units are required, it is not necessary to fire any additional high pressure or low pressure boilers.

Texas-Size Heat Pump

Operating costs of 150 ton capacity heat pump system being carefully compiled by Gulf States' engineers.

THE efficient transmission and distribution headquarters for the Gulf States Utilities Company at Beaumont, Texas, were described in the September, 1950, issue of SOUTHERN POWER & INDUSTRY.

The modern Service Center now serves as headquarters for some 300 employees who maintain the Beaumont Division electric transmission and distribution system.

In addition to extensive materials handling equipment, radiant heating in the service garage and unique buildings designed for low maintenance costs, Gulf States' engineers equipped their office building with reverse-cycle heating along with the cooling equipment.

R. S. Sandifer and J. R. Jones, sales engineers with York's Houston, Texas, office report that engineers of the Gulf States Utilities Company are keeping accurate costs on the operating expenses for both cooling and heating and will be able, within the next year, to give a comprehensive report on the operating costs of this system.

Installational Data

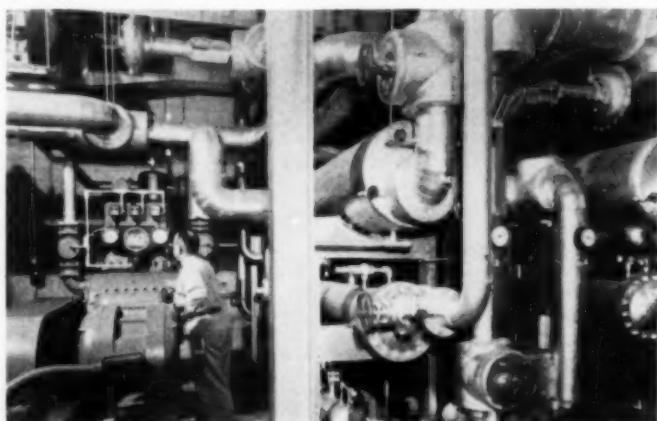
Two systems were specified, each consisting of a Freon-12 compressor with driving motor, condenser, and water chiller along with coil type conditioners, auxiliaries, and controls.

Well water is used in the Freon

condensers to liquefy the refrigerant during the normal cooling operation. This same well water is used in winter through the water chiller to provide the refrigerating load for the compressor to heat the recirculated condenser water to the desired temperature for heating purposes.

Automatic control is provided for both summer cooling and winter heating. Water leaving the cooler in summer operation is maintained at an average temperature of 43 F. For winter heating, a water temperature of 107 F from the condenser is maintained.

York Heat pump system of 150 ton capacity as installed in the office building of Gulf States Utilities Company's Service Center in Beaumont, Texas. Complete installation was made by Reed Company, York distributor in Beaumont.



Stepping Up Production at Southwestern Veneer Company Cotton Plant, Arkansas

Heating and drainage system increases veneer dryer output 22% . . . boiler return system eliminates trap maintenance . . . fuel savings

Production Problems

Number one problem of the Southwestern Veneer Company at Cotton Plant, Arkansas, was to increase the output of their veneer dryer. The dryer was about 20 per cent below

TO increase production on the veneer dryer, Southwestern Veneer Company engineering personnel installed a Fred H. Schaub QUICK-TEMP heating and drainage system. This replaced all conventional steam traps. Large capacity non-clogging stainless steel metering units were placed in the return line with gravity drainage to an accumulator.

Air and steam drain continuously to the accumulator which vents the air. The condensate is discharged to the open return line by means of a motorized valve which is float switch controlled to assure a liquid seal at all times. This method of releasing the condensate prevents the possibility of live steam leakage and loss in the open return.

As a result of this installation, the productive output of the dryer (handling the same type material and using the same steam pressure as before) was stepped up 20 per cent. This made possible an overall 10 per cent increase in total plant output.

Operational Feature

In the QUICK-TEMP a constant flow of steam goes through the metering units along with the condensate to the accumulator. From the accumulator the excess steam is drawn off again and re-used by

the capacity of the veneer panel plant.

Secondary problem was a sudden increase in fuel costs. During the previous winter it was necessary to purchase cord wood to supplement the regular plant waste fuel supply. Cost was approximately \$6,000.

certain steam heated elements in the dryer. This continuous steam flow characteristic "scrubs away" the dual heat insulation films of air and water that exist in thin layers on the walls of any steam cavity, in this case pipe coils, when steam flow is stagnant (as in the case of conventional trapping.) The higher rate of heat transfer thus achieved produced faster drying.

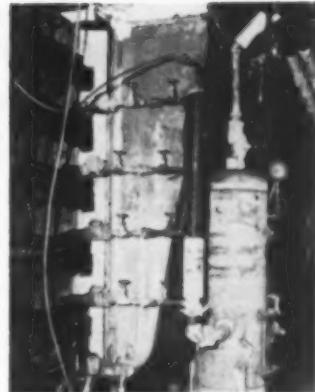
Fuel Problem

But increasing the dryer output still left the \$6000 cord wood fuel bill premium to be attacked. This problem was solved by installing a Schaub boiler return system with spray type deaerating receiver. Reclamation of all high and low pressure returns, deaeration of all boiler feed water, and use of a motor driven turbine type feed pump helped in several directions. The feed water temperature was raised thereby reducing primary

Improvements

The Southwestern Veneer Company plant engineering personnel list the following production improvements as the result of the new heating and drainage and boiler return systems.

Productive capacity of the veneer dryer increased by 20 per cent and



The Fred H. Schaub QUICK-TEMP heating and drainage system installed at the Southwestern Veneer Company plant at Cotton Plant, Arkansas. Engineering layout was originated by A. P. Woody Engineering Company, Gulfport, Mississippi; installation supervision by Mullins Engineering Company, Little Rock, Arkansas.

fuel cost, high efficiency electric pumping lowered pumping cost, and deaeration reduced corrosion to a minimum. Deaeration also helped by reducing the air content of all steam generated so that now all steam heated equipment—including glue pots, unit heaters, etc.—are better heated.

Another helpful contribution of the return system was the installation of a Magnetrol combination water column and controller which controls the electric feed pump within $\frac{1}{8}$ in. boiler water level variation and also provides low water cut-off protection. Holding a lower boiler water level safely and within close limits provided more steam space in the boiler at all times which in turn eliminated the periodic priming and wet steam problem formerly experienced. Pressure regulation was also helped by closer control of the boiler water level.

overall plant production increased approximately 10 per cent.

There was a yearly fuel saving of approximately \$6,000.

Other supplemental improvements were: deaeration of all boiler feed water, elimination of all trap maintenance, and completely automatic boiler water level control with higher quality steam generated at more constant pressure.

**simplify
power distribution
change-over with**

Bus Duct

WHEN military contracts are accepted, existing production lines must be revamped and new machines installed to produce material usually far different from that normally handled. As maximum production will be resumed as soon as possible, easily relocated power distribution equipment is extremely valuable.

Bus duct can simplify the secondary power distribution change-over by its flexibility and high-current-carrying capacity. Types readily available and general applicational data are tabulated.

It does not matter whether power is supplied by a utility company, by a transformer bank, or by unit substations on the plant property; bus duct can be used singly or in combinations. That is, it can be entirely plug-in duct or a combina-

tion of low-impedance feeder and plug-in duct.

The portion of the duct outside

the building is of weatherproof construction, where the delta or wye connections can be made on the

Typical plant installation of plug-in and low-impedance bus-duct. In the background note the various runs of duct entering the low-voltage switch-gear unit and the large run going outside to the transformer.



Large scale changes in production lines, machines and current loads and the subsequent alteration of secondary power distribution systems face industry once again. Here's how bus duct can simplify the secondary power distribution change-over by its flexibility and high-current-carrying capacity.

By J. WASHBURN

Application Engineer
Westinghouse Electric Corporation

bus duct system itself. Or, if the utility company supplies power, weatherhead connection is available. Inside the plant, a grid-work of plug-in duct can be installed with the individual runs on 50 ft centers, thus making maximum horizontal cable feeds 25 ft long plus the vertical drop.

Any change in the production line for efficiency can be accomplished easily. If additional machines are added, all that is necessary is to connect short cable runs from the plug-in units on the duct to the machines. If a machine is moved to a new location, the plug-in unit goes with it to the new location for connection to the system.

Combination Runs

Frequently, continuity of service is of primary importance, and load requirements make it necessary to have several unit substations installed in the plant. Here, the system can be a combination system with low-impedance feeder duct and branch runs of plug-in duct. The feeder runs are interconnected between the unit substations with an isolating device installed in the feeder duct. Each substation normally serves its own load.

In case of a substation outage, the isolating device can be closed to transfer the load to other substations. This assures minimum production interruptions.

In either of these two examples, additional flexibility is possible by maintaining a constant gap between ends of branch runs of plug-in duct. For example, if runs terminate within 10 ft of each other, and if one branch run should become overloaded through production changes, the condition can be overcome easily. It is necessary only to transfer a 10-foot section into the gap to shift the load to another substation.

A bus duct system can supply

This view in the machine shop section of a plant maintenance department shows how individual conduits branch off a bus-duct run. Fastening new conduit connections and running them to a machine is an easy job. The three-phase, four-wire system, 120-208 volts a-c, makes it possible to use any combination of single-phase and three-phase motor driven machines in any part of the plant.

Types Available . . . Applicational Data

Bus duct consists of conductors within an enclosure, and is manufactured in straight lengths, elbows, tees, crossovers and necessary fittings for a complete secondary distribution system.

It is simple to install, requiring only the bolting together of the various sections and fittings and the adjusting of the hanger supports. Standard bus duct is supplied in ratings from 225 through 4000 amp for systems up to and including 600 v.

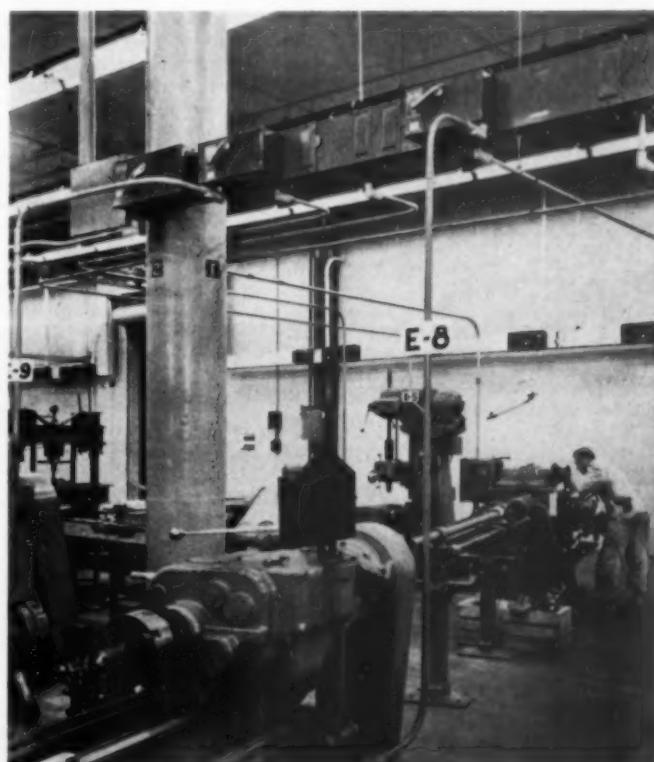
Two types are available—feeder and plug-in. Feeder bus duct, for indoor or outdoor use only is designed primarily for feeder service, but power taps can be provided at any section joint. It is generally of the low-impedance type, where the bus bar ar-

rangement provides extremely low voltage drop in the system. It is available in ratings from 600 through 4000 amp capacity. Above 4000 amp, it is possible to parallel runs.

Plug-in bus duct, by far the most versatile for inside installation, is provided with plug-in openings on 12-in. centers or ten in each 10 ft section. It can be installed convenient to the production machines served, and power is tapped from the system by means of protective units plugged into the bus duct.

Plug-in units consist of circuit breaker, fusible, combination line-starter, capacitor and lighting transformer types. This type of duct is available in ratings from 225 amp through 1500 amp.

a hundred feet of duct to many thousands of feet. Bus duct has already been installed in plants of practically every type of industry, large and small.





Steel skid boxes containing machined parts are stacked in orderly rows in the warehouse. Bin loads vary in weight from 500 to 2,000 lb, depending upon contents. Bulk aluminum die castings may weigh only 500 lb, while finished steel parts, such as spindles, laminations, etc., will weigh up to 2,000 lb.

Women operators are used in the new Black & Decker warehouse. This fork lift truck is moving a 1,200 lb palletized load of finished product from storage area into outward shipment. Designed for handling and storing of items by means of powered industrial trucks, the building has 60,000 sq ft of floor space, and 16 ft ceilings.



Black & Decker's truck-pallet system at Towson, Maryland

Production Equipment—Three highlift platform trucks, each of 4,000 lb capacity and a lift of 6 ft, 8-in., three fork trucks, one of 4,000 lb capacity and two of 2,000 lb and capable of lifting loads at least 10 ft; three powered platform type, hand trucks; and a small, portable powered stacking truck.

Warehouse Equipment—Two 2,000 lb capacity, rider type, telescopic lift fork trucks and a 4,000 lb capacity, powered pallet-handling hand truck.

Function—Trucks in production department handle skid-boxes and large tote pans of material into assembly lines and move semi-finished, or completed assemblies into warehouse area. Machined items also handled in skid-bins. In warehouse storage area of approximately 750,000 cu ft, fork trucks tier material to an extreme height of 15 ft.

Because the new warehouse building is located at some distance from the main buildings, material is transported from the shipping area of the latter to the warehouse by means of over-the-road trailer trucks. Here a pallet load (approximately 1,500 lb) of finished tools, in cartons, is placed on a highway trailer truck for transportation from the packing department to warehouse. Due to inequality between levels of loading dock and trailer bed, the fork truck does not operate within the trailer truck's body but, instead, pushes the pallets into the trailer. Pallet loads run as high as 2,000 lb.



Utilizing a special type of storage rack, each unit of which is capable of accommodating a 3,000 lb load, a fork truck tiers a full load of coil steel used in the making of motor laminations. Special racks hold coils in vertical position. Recesses, faced with flanges, are located in the bottom of the four legs of a rack. These recesses fit over flanged points on the top of the legs, providing self-adjusting stabilizing legs, insuring rigidity when the racks are tiered three or four high in storage.

USE of powered industrial trucks by Black & Decker, world's largest manufacturers of portable electric tools and accessories, goes back to 1930 when a 4,000 lb capacity, highlift platform truck was placed in operation in the production department, handling skid-loads of material into, along, and out of production lines.

Approximately 10 years ago, Black & Decker's Towson, Maryland, plant purchased a fork truck when they decided to palletize certain items for handling, and also purchased a second highlift platform truck to be used in conjunction with the original platform unit.

According to George Gallup, expeditor in charge of trucking for the Maryland plant, a production increase necessitated faster handling both into, and out of, production lines. Other trucks were added in this department until at present three highlift platform trucks, three fork trucks, three platform type trucks, and a small, portable, powered stacking truck are in operation.

The main plant at Towson consists of three buildings. Built on a slight grade, access between two of these buildings is by means of ramps with an 8 per cent grade. The powered trucks easily negotiate these ramps in shuttling between production and the warehouse.

New Warehouse Operation

The company's new warehouse has over 60,000 sq ft of floor space, some 50,000 of which is devoted to storage operations. Because of the ceiling height of 16 ft, approximately 750,000 cu ft of storage area is available, the fork trucks tiering material to an extreme height of 15 ft.

Here one talks of storage space in terms of cube rather than square footage. Trucks can elevate loads to a height of 13½ ft. Ceilings in the old warehouse were only 9½ ft above the floor, and manual handling of items was the rule. In this new building, two rider type fork trucks are operated by women, who, in handling unit loads, do work that formerly required twelve men to handle.

The former warehouse had 30,000 sq ft of floor space, 9½ ft ceilings. Practically every piece of material stored in this building was handled manually, with a crew of eighteen men engaged in handling operations. In the new building, which was designed for, and erected with a view to utilizing mechanized material handling equipment, insofar as is possible, all handling operations—including the loading of trailer trucks with outbound merchandise—are performed by the powered industrial trucks.

Girl Operators

The two rider-type fork trucks in the warehouse are operated by girls. Black & Decker have found them most capable and they are able, with the fork truck-pallet system to handle approximately 100 tons a day, or slightly more than 2,000 tons of merchandise a month, in and out of storage, doing work that under former manual methods required a twelve-man crew.

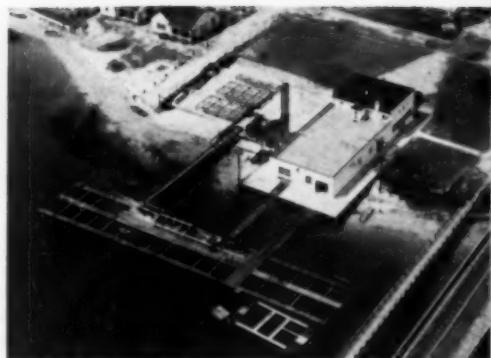
Top Efficiency

While, at first glance, it would seem that Black & Decker has been compelled to increase their warehouse force by some 50 per cent, the force in effect remains the same in number as previously. All are kept busy because they handle many times the volume they did before and work is performed more rapidly with resultant satisfaction to branches and customers.

Production also is keeping pace with advanced handling methods because raw materials move in to production line faster, while finished product is removed with the same speed, and does not pile up awaiting removal.



The Harbor Island laboratory of International Nickel Company at Wrightsville Beach, North Carolina, is corrosion test headquarters for studies being made by Inco and participated in by many cooperating companies. Here the inlet through which sea water flows back and forth with the tides forms "an ocean test tube" for exposing specimens.



CORROSION TESTS

New Inco Marine Laboratory—North Carolina

To say that corrosion is beginning to be understood seems like a mild statement when consideration is given to the vast accomplishments of many skilled scientists that have given the better portion of their lives to its study. But a recent visit to the new International Nickel Company Marine Laboratory at Wrightsville Beach, N. C., is convincing evidence that these same scientists themselves see corrosion research as a job which must continue—no more temporary structures in improvised quarters, but permanent flexible equipment designed for continued experimentation.

A distinguishing feature of the research project at Kure Beach and

Harbor Island is the manner in which producers of sometimes competitive products have united in the fight on their common enemy—corrosion.

Ocean Test Tube

With the establishment of the new Inco Marine Laboratory at Harbor Island (Wrightsville Beach), the cooperation of industries that characterized the original work at Kure Beach (12 miles south of Wrightsville) is not only being maintained, but is being expanded. Here the inlet, through which sea water flows back and forth with the changes in the tides, forms an even better "Ocean Test Tube" than the basin at Kure Beach which was

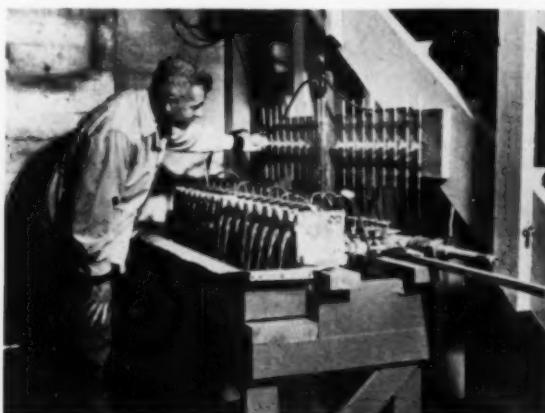
first given that very appropriate name.

Data accumulated over the years will continue to be exchanged freely and made available to all industry, as well as to the government agencies for whom and with whose cooperation much of the research has been undertaken.

Storm damage to the basin at the Ethyl-Dow plant at Kure Beach, where the underwater tests were conducted with the invaluable cooperation of the Dow Chemical Company and the Ethyl-Dow Chemical Company for almost 16 years, necessitated the move to the new Harbor Island site.

The many people who have demonstrated their interest in these ac-

This aspirator type of jet testing apparatus subjects test specimens to the erosive effects of high velocity jets of sea water mixed with air bubbles. It has been particularly useful in developing and evaluating condenser tube alloys resistant to "impingement attack".



The study of the anti-fouling characteristics of metals, alloys, plastics, and protective coatings is conducted with the cooperation of Dr. William F. Clapp of the William F. Clapp Laboratories, Inc.



tivities and the problems toward which they are directed have become banded together informally to create what has been called The Sea Horse Institute. It seems only natural, therefore, that this name has become attached equally informally to the new Inco testing station at Harbor Island.

Personnel

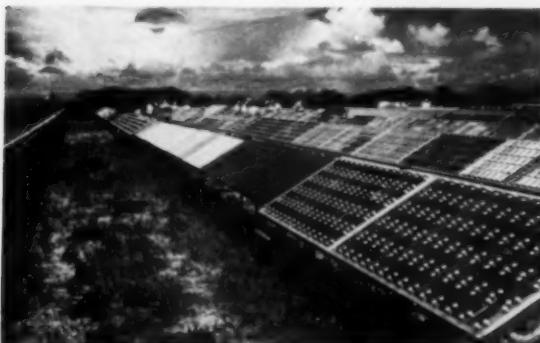
As heretofore, this operation, as well as the atmospheric sea spray corrosion testing facilities which remain undisturbed on the Ethyl-Dow Chemical Company property at Kure Beach, are under the direction of F. L. LaQue, in charge of the Corrosion Engineering Section of The International Nickel Company's Development and Research Division in New York. The resident manager of both the Harbor Island and Kure Beach operations is H. T. Paterson, Jr.

The number of specimens now exposed in sea water is over 2,500, and, during the past 15 years, the number of specimens so tested has been over 15,000.

Cooperative Effort

All of this testing has been essentially a cooperative effort, involving Inco and producers and users of materials and coatings. Many of those interested in the tests visit the test site each year

Effects of atmospheric corrosion are measured by visual observation and by determinations of weight loss, changes in mechanical properties, or both. The test frames shown below with their insulators, may be made to accommodate several types and sizes of specimens. For studying the action of sea water flowing at moderate velocities, specimens are immersed in the troughs shown at right. The 600 feet of trough now being used will accommodate several hundred test pieces.



Advantages Provided at the New Test Site

1. A continuous supply of full strength sea water, uncontaminated by industrial wastes, oil films or other pollution that interfere with tests in harbors or near big cities.
2. A relatively wide range of sea water temperature (45° to 85°F.).
3. A long season of growth of a large number of marine organisms (of particular value in studying anti-fouling alloys and coatings).
4. Protection against the physically destructive effects of storms and high waves.
5. A fluctuation in water level with the rise and fall of the tides which permits observation of waterline and intermittent immersion effects when desired.
6. Adequate protection to prevent the theft of or tampering with specimens.
7. The availability of personnel and mechanical equipment needed to erect the testing equipment, keep it in repair, and handle the heavy racks of test specimens.

when specimens are withdrawn from water for examination. The number of visitors during the past 5 years has been over 1500, representing over 100 companies, in addition to the various government services concerned with sea water and sea air corrosion problems.

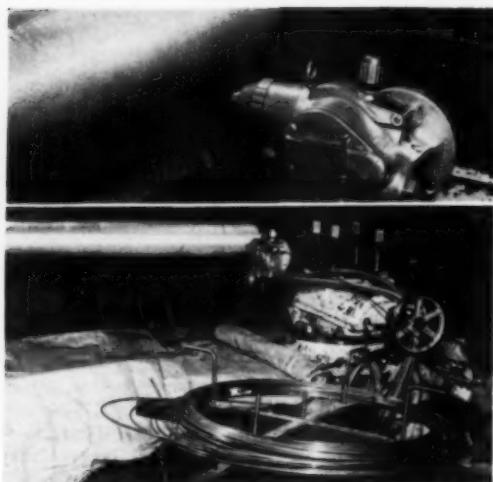
Since corrosion by marine atmospheres is equal in importance to corrosion by salt water, facilities have been provided for extensive atmospheric corrosion tests. Up to the present time, over 20,000 specimens have been exposed and checked by Inco and cooperating companies. This atmospheric test lot is located at Kure Beach about

250 yards from the ocean shore.

When planning and building the new Harbor Island station, Frank LaQue thought space was being provided to take care of years of growth, but already some of the test stands are crowded. Scientists believe in tests and proofs—not mere opinion. Even "field experience" is sometimes found to be at variance with fact. The work at Harbor Island frequently brings forth surprises. But for the most part we see gradual, unspectacular broadening of the base of knowledge upon which the fight against deterioration is based—corrosion is really beginning to be understood.



Photo-Maintenance . . . How Piston Rod Was



Close-up of spray gun; equipment used; and initial machining operation

Sufficient metal is removed with a lathe to make part $\frac{1}{8}$ -in. under standard size, cut extending $\frac{1}{2}$ -in. beyond the worn surface at each end, and ends of the cut being undercut at a 20 degree angle.

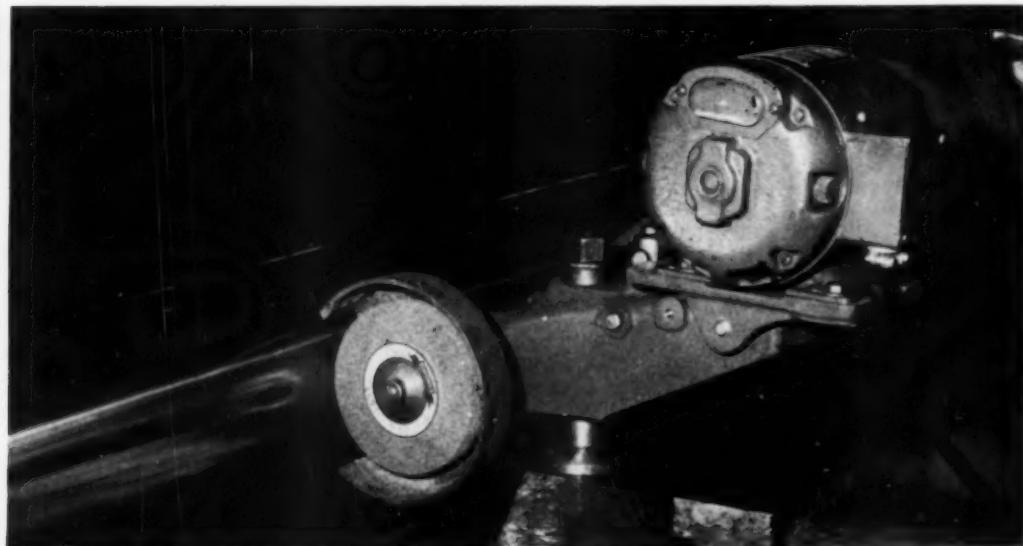
Next, 16, 60-degree "V" threads per inch are cut with a very



rough finish being left on the threads. Threads are then rolled with a knurling tool (see above right) to flatten them, forming a hook effect to help anchor sprayed metal.

Metal spraying gun is mounted in lathe tool post, inserting the 3/16-in. stainless steel wire in the gun and connecting

Dressing coated piston rod with emery tool post grinder



Renovated at United Gas Compressor Station

This photo-maintenance method is the reclaiming for indefinite re-use a worn twin tandem power piston rod from one of the 1,000 hp compressor engines at the Latex station of United Gas near Shreveport, Louisiana. The worn rod is being brought back to standard size (6 1/4 in. in diameter by 13 ft in length) by metal spraying with stainless hard surface steel to resist metallic packing wear on the rod.

W. O. Nowlin, shop foreman of the Latex Compressor Station, United Gas Pipe Line Company, describes how metal spraying equipment has proved its value in salvaging worn mechanical equipment and parts for continued efficient use. Data and illustrations have been adapted from a recent issue of the UNITED GAS LOG, official publication of the company.



Spraying stainless steel on piston rod

hoses for oxygen, acetylene and compressed air. Air feeds wire through gun at constant rate of speed. Oxygen and acetylene provide fuel for melting the wire. Rod is rotated until sprayed portion is .035-in. diameter oversize.

Piston rod is then turned down in lathe to .003-in. oversize for

ground finish. Rod's treated surface is now approximately three times as hard as original finish and cemented carbide tip tool has to be used for cutting.

Final step is grinding with emery wheel tool post grinder for polished finish and standard size.

Final polishing operation on piston rod



Metal spraying is a process of building up worn material to bring it back to standard size. It provides a means of treating moving parts with hard surface material to stand up under hard usage. It may be used in treating metal against corrosion, i.e., application of aluminum to hot pipe or mufflers.

POWER for the Southwest

Industrial prospects . . special industry notes . . small plant power distribution . . selecting the right motor . . adjustable speed drives . . polyphase motors . . lighting . . air conditioning and refrigeration.



H. A. White, Manager, Southwest District, General Electric Company, Dallas, Texas and Horace Zimmer, Manager, District Operations, Schenectady, New York at the June 27th G.E. Power Conference in Dallas.

Staff Report on the G. E. Industrial Power Conference—Dallas

AT the June 27th "Southwestern Industrial Power Application Conference" in Dallas, Texas, General Electric application engineers and specialists told representatives of Southwestern power companies how they could increase industrial

power sales by recognizing opportunities for new equipment application or expansion of conventional loads. The conference was held as part of General Electric's "More Power to America" program.

While attendance was limited to

power company representatives, the papers presented are of general interest to engineers and production men throughout Southern industry.

27 Million kw Scheduled

The conference was opened by

Ralph Randall, G.E., Oklahoma City, Okla.; D. J. Fransen, Public Service Co. of Okla., Tulsa, Okla.; and R. L. Dunton, Central Power & Light Co., Corpus Christi, Texas.

J. T. Green, T. C. Root and U. H. Ohman with Texas Power & Light Co., of Waxahachie, Sherman and Dallas, Texas respectively; and R. T. Shiels, G.E., Dallas, Texas.

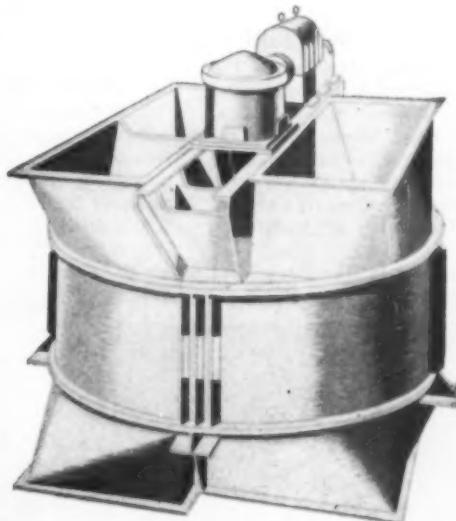


The Ljungstrom Air Preheater Can Help You

- 1. To improve combustion of low-grade fuels
- 2. To raise the level of heat recovery
- 3. To save materials in plant design

If you want to improve the combustion of low-grade fuels . . . raise the level of heat recovery . . . conserve critical materials in plant design . . . you or your consultants can make profitable use of Preheater experience. Let our specialists tell you more about the Ljungstrom Air Preheater, and the outstanding job it has done for hundreds of America's leading industries and public utilities, where the need for preheated air from 300°F to approximately 1200°F was part of their problem. Our engineers are ready to work with you in applying the Ljungstrom to your own heat recovery problem.

The Ljungstrom operates on the continuous regenerative counterflow principle. The heat transfer surfaces in the rotor act as heat accumulators. As the rotor revolves the heat is transferred from the waste gases to the incoming cold air.



THE AIR PREHEATER CORPORATION

60 East 42nd Street, New York 17, N. Y.

SOUTHERN POWER & INDUSTRY for AUGUST, 1951

Prospects for the Next Five Years

The power application conference general sessions were held in the auditorium of the Dallas Power & Light Company. At the noon luncheon held in the Dallas Engineers Club, *Horace Zimmer*, Manager, District Operations, Schenectady, gave his views on

the industrial prospects for this country during the coming five years. Not only was his talk optimistic, but his opinions were backed up by clear logic and understandable statistics. A portion of Mr. Zimmer's comments are featured on page 39.

H. A. White, Manager of the Southwestern District, who set the optimistic theme of the meeting by pointing out that the public utilities are facing a period of rapid but healthy growth.

In 1950, projected plans of utilities for expansion of generating power foresaw the construction of 17 million kw in the then three years ahead. Now, just one year later, plans call for construction of 27 million kw in the coming three year period. Mr. White also told the conference that in the past six years, the industrial use of power had increased from 5 to 7 kw per worker. He then turned the meeting over to *E. C. Wise*, Manager of General Electric's Industrial Division in Dallas.

Plant Surveys Build Load

W. F. Strong, Applications Engineer, explained how plant surveys by power salesmen could build industrial load. When making the survey, look for the following: (1) operations which are not now being performed; (2) operations now being performed but non-electrically;

and (3) operations being performed electrically which might be enlarged.

For instance, watch for gas ovens or blow-torches, for these suggest the possibility of applying induction heating. In one case, a manufacturer of hatchets increased production 100 per cent by installing a 20 kw induction heater for heat treating the blade edge.

Mr. Strong also showed a number of slides illustrating the application of new or better industrial electrical equipment. These included examples of dielectric heat being used to dry wet yarn, and heating cable used to warm earth in greenhouses. A manufacturer of commercial refrigerator boxes in San Antonio uses heating cable to keep frost from collecting on the glass top of the display boxes.

Power Distribution

J. M. Glendinning, Switchgear Specialist, explained to the Conference, the savings possible for both the power company and the customer through the use of Load Center Distribution. Power sales-

men can point out the savings to every plant manager who is contemplating modernization or enlargement of facilities. A recent incentive is the new underwriters ruling permitting voltage as high as 15 kv to enter industrial buildings. Earlier limitations on voltage have prevented installation of the best power distribution system.

Selecting the Right Motor

General Electric's Dallas Motor Specialist, *J. F. Macphearson*, emphasized the importance of selecting the right motor to fit the customer's needs. Consideration must be given to the power supply, type of load, and atmosphere in which the motor operates. There are motors especially designed to suit practically every possible application. For example, there are six major types of adjustable speed motors, each with different characteristics designed to fit specific industrial plant needs.

There is considerable need in the Southwest, according to Mr. Macphearson, for the application of more slow speed, synchronous motors. He demonstrated how General Mills, in their Texas plant, had saved \$15,000 per year by replacing two, 350 hp gas engines and rope drives, with two, 500 hp synchronous motors line shaft mounted. The electric motors showed only 10 hours of down time per year against 56 hours for the gas engines.

The application of adjustable speed drives to the printing and

T. C. Root, Jr., *J. T. Green*, Texas Power & Light Co.; *William Guice*, Southwestern Gas & Electric Co., Shreveport, La., and *E. E. Umlang*, Texaco Power & Light Co.

T. A. Willis, *W. C. Tillman*, *Pat Fralia* and *Max Mobley* of Texas Power & Light Co. Mr. Tillman is with the Wichita Falls office, others in Fort Worth, Texas.



FOR EVERY INDUSTRY OR INSTITUTION



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STEAM GENERATOR
TO PRODUCE THE STEAM
YOU NEED



Wickes shop-assembled Steam generator

WICKES

Whatever you are, whatever your steam generating needs may be, there's a custom-built Wickes boiler to suit your operation. For almost a century now, The Wickes Boiler Company has been leading the field in the manufacture of high-pressure boilers. Throughout the world, industries and institutions that depend on steam have learned by long experience that they can depend on Wickes. Wickes Boilers operate at a high degree of efficiency and owners' records show very modest maintenance costs. Wickes can fill your requirements for steam generators up to 250,000 lbs. per hour and 850 lbs. per square inch . . . all types of multiple drum boilers adaptable to any standard method of firing. Contact your nearest Wickes representative or write to our home office.

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RECOGNIZED QUALITY SINCE 1854 • SALES OFFICES: • Atlanta • Boston • Chicago • Cincinnati • Denver • Detroit • Houston • Indianapolis • Los Angeles • Milwaukee • New York City • Pittsburgh • Saginaw • San Francisco • San Jose • Springfield • Seattle • St. Louis • Tulsa • Mexico City • Buenos Aires • Manila • Havana • Montevideo • San Juan, P. R. • Victoria, B. C.

rock products industries was covered by *E. D. Button* of the Dallas office and by *J. A. Taylor* of General Electric's Oklahoma City office.

Mr. Button divided the printing industry into three classes, according to the size and type of press used, and explained the new types

of adjustable speed press motors which have been developed for each classification. Large city daily newspaper presses are now using electronic drives, but these are not economically applicable to drives of less than 200 hp. Wound rotor motors are generally used on the

small newspaper presses, demanding 40-200 hp. And while there have been no recent changes in design of these motors, controls have been improved.

The ACA motor in sizes from 3-50 hp is particularly adaptable to small

(Continued on page 116)

steam and hot water Unit Heaters

types available selection and application installation data

data courtesy
Industrial Unit Heater Association

STEAM or hot water unit heaters provide an economical and practical method of heating industrial buildings. They provide heating comfort at low original cost and low operating costs and are easily adaptable to equipment and floor layout.

Unit heaters heat quickly from a cold start; they maintain the desired temperature easily; and they distribute the heat uniformly throughout the working zone

through the use of forced air circulation.

Another important advantage of a unit heater system—in terms of cost as well as comfort—is that it's flexible. Heating can be changed to meet different requirements, by using different models or ranges of capacity, single or two-speed motors and individual thermostatic controls.

The heating capacity of unit heaters is often equivalent to the

capacity of cast iron radiation pipe coils costing twice as much. A unit heater system requires a proportionately small amount of pipe fittings and accessories.

Fuel costs are lower and heat is more efficient. Instead of being banked uselessly against the ceiling, the heat is forced down to the floor level.

Heat is turned on or off simply by throwing the switch manually or by thermostatic control. Rapid response insures heat furnished only when and where desired; none is wasted. Fuel savings alone, in the majority of cases, pay for a new heating system in about two or three years.

A unit heating system consists only of simple piping over head. Therefore, it can easily be adapted to do an efficient heating job with-

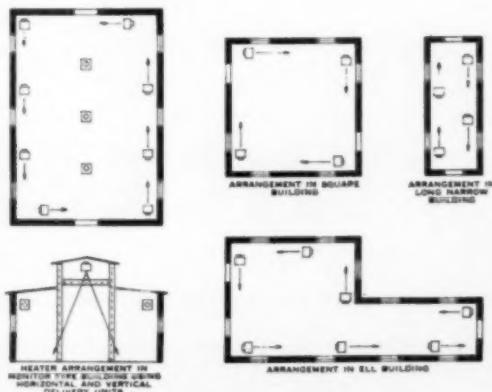
Types of Unit Heaters

Either of the following types of unit heaters may be designed to blow the air horizontally or vertically.

Horizontal discharge propeller type unit heaters are suspended from the ceiling or mounted on a wall. Centrifugal type for horizontal discharge is floor mounted. Heat flow is downward, away from the ceiling and directly toward the areas where heat is needed.

Vertical or downblast discharge unit heaters, both propeller and centrifugal types, are suspended from the ceiling only and intended for use in buildings with high ceilings. Heat from the vertical discharge design is forced downward and out to cover wide areas.

Diagram of typical heater arrangements



YARWAY REMOTE LIQUID LEVEL INDICATOR

How many applications fit your plant needs?

Versatility is just one feature of the Yarway Remote Liquid Level Indicator... leading to a variety of installation possibilities in any plant.

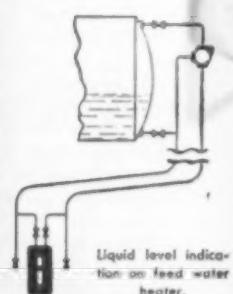
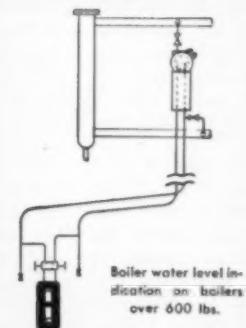
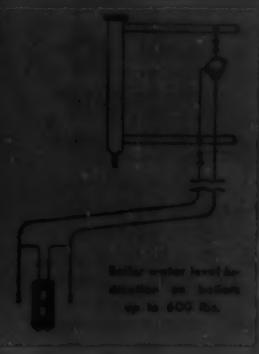
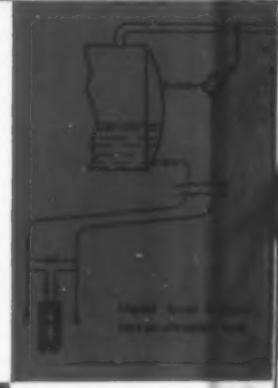
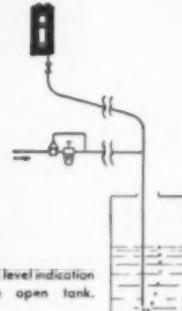
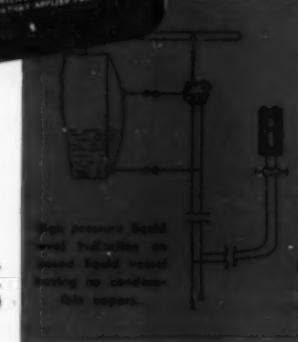
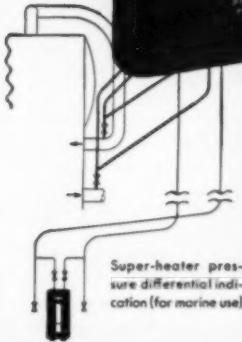
Wherever it's need, accurate level indication is always assured because the Yarway Indicator is operated by the liquid itself - by the pressure differential between constant head and varying head. Magnetic transmission. No stuffing boxes.

Write for Bulletin WG-13, or Bulletin WG-1830 on the Recording Indicator for the same applications.

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YARWAY REMOTE LIQUID LEVEL INDICATOR

Types of Diffusers



DOUBLE LOUVRE ASSEMBLY
(ADJUSTABLE)



CONE ASSEMBLY
(ADJUSTABLE)



FOUR-WAY LOUVRE ASSEMBLY
(ADJUSTABLE)



3 CORE ANEMOSTAT (NU-3)
(4 CORE ALSO AVAILABLE)

WHEN DIFFUSERS ARE USED
THE OVER-ALL HEIGHT OF UNIT
IS INCREASED ACCORDINGLY.
SPECIFY TYPE DESIRED.

out disturbing the equipment and floor layout. Valuable floor and wall space, otherwise used for other types of heating systems, can be utilized for other purposes.

A unit heater system makes great economies possible when alterations are necessary. Units can be relocated easily at any time to meet layout changes when new machines and equipment are added. In such cases, heat distribution patterns can be reconstructed to meet new working requirements.

Selection and Application

Heat Loss and Air Requirements—The first step is to determine the heat loss of the building or room to be heated. This is done by the usual Btu method.

Next the cubic feet per minute necessary to provide sufficient circulation of air is calculated. Any approved method may be used. A rough guide to follow is to provide at least three air changes per hour in rooms held at 40F up to a maximum of six air changes per hour in rooms held at 70F. In spaces with high ceilings, only the volume of the space below the highest unit need be used in calculating air changes.

Arrangements—To provide utmost physical comfort, a unit heater system should consist of a number of units well distributed. The air flow from one unit should support the air flow of the adjacent unit.

Wherever possible, the air flow should be parallel to the cold wall so that there is the least possible disturbance of the cold air film above the wall. Disturbing the cold air film increases the heat

loss through the windows and walls.

For worker comfort, unit heaters should be arranged to blow in open spaces, not directly on workers. Where there are cold drafts from doors and other outside openings, air flow from the unit heater should be across the openings.

Where physical comfort is not an important factor, such as in warehouses, economy of installation and operation is generally of greatest importance. In such cases, units can usually be selected and arranged with economical piping as the prime factor. An important point should be kept in mind: One large unit may have a lower original installation cost, but when operating costs are considered, multiple installation of two or three smaller units may be more economical due to the smaller horsepower of the motors.

Mounting Height—Units never should be installed higher than the maximum mounting height recommended by the manufacturer except in those rooms where the space below the floor is heated. In such instances, one or two feet may be added to the maximum mounting height. For efficient performance, unit heaters should be installed with the back or side of the unit not less than three feet from the wall.

Selection of Size and Type—Careful consideration should be given to the type of unit best suited for the application. In rooms having ceiling heights of less than 20 ft, horizontal discharge units are usually more suitable, providing there are no obstructions to prevent the free movement of heated air. In rooms

with obstructions or high ceilings, vertical discharge units may be more practical. Again, a combination of horizontal and vertical units may be the most practical solution.

The units selected should have a heating capacity equal to the heat losses of the space to be heated. Unit heaters should be placed so that the path of discharge air will not be broken by some object in the area. Units should be located so that the discharge air can get to the floor for best results.

When an outside air intake is used, unit heaters should be selected for the entering air temperature that will prevail.

If high temperature steam is used, unit heaters with a low temperature rise should be selected.

If the air volume of room is large compared to the heat losses, low temperature rise unit heaters having a large air volume should be selected for proper distribution of the heat available.

The units should have an air capacity sufficient to move the entire cubical content of the room through the heaters at least three times per hour in large rooms.

Where quiet operation is essential, unit heaters with a low decibel rating should be selected. Unit heaters with speed controls may be used for these installations since the speed of the propeller fan can be reduced to minimize noise.

To sum up, in selecting and locating unit heaters, select units with sufficient capacity, high operating efficiency, and quiet operating fans and motors. Locate units to give distribution of heat in accord with calculated heat losses and to provide the heat distribution which best promotes employee efficiency. Locate the units in accord with the mounting heights recommended by the unit manufacturer.

Certified Ratings—Care should be taken in selecting unit heaters so that they will do the heating job required. Unit heaters purchased should be rated in accordance with the standard test code adopted jointly by the Industrial Unit Heater Association and the A.S.H.V.E.

Versatile B&W KAOCAST

*eliminates
expensive delays*



WHAT SPECIAL REFRACtORY SHAPES DO YOU NEED QUICKLY?



BURNER RING



TUBE TILE



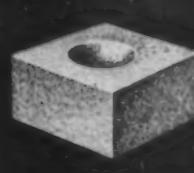
SKEW BLOCK



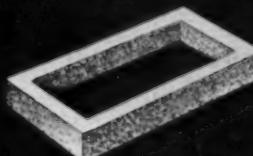
LINTEL TILE



SLAG TILE



PEEPHOLE BLOCK



SEALING PIECE



DOOR LINING



CAR TOP

Special shapes are never special problems if you have B&W Kaocast on hand! With this truly unique, versatile 3000F Refractory Castable they can be molded quickly and easily, *by you, when you need them*. Kaocast can be cast directly in place or applied by cement gun. No expensive inventory is needed for car tops, burner tile, peephole blocks, baffles, bridge walls, door linings, arches, piers and scores of other refractory shapes. You get fast repairs, at less cost.

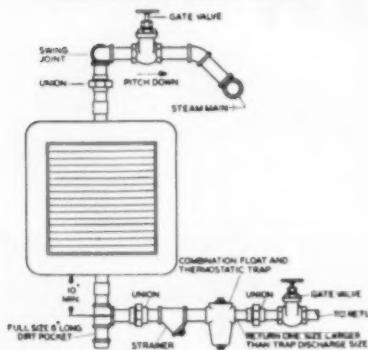
Kaocast stays on the job, too. It offers high resistance to spalling and slag attack. It has low volume change on initial firing and negligible reheat shrinkage. Thus Kaocast increases furnace availability and decreases production costs.

Put B&W Kaocast to work in your plant. This money saving refractory is another product of B&W's 30 years of specialized refractories engineering. Consult your B&W Refractories Engineer, or write for Bulletin R-22.

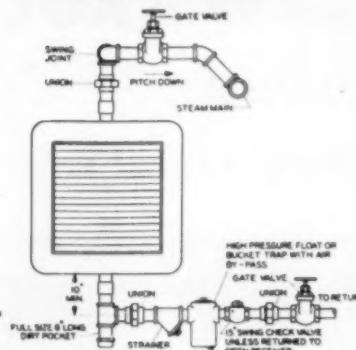


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B&W Refractory Castables, Plastics and Mortars • **OTHER B&W PRODUCTS**—Stationary & Marine Boilers and Component Equipment... Chemical Recovery Units... Seamless & Welded Tubes... Pulverizers... Fuel Burning Equipment... Pressure Vessels... Alloy Castings

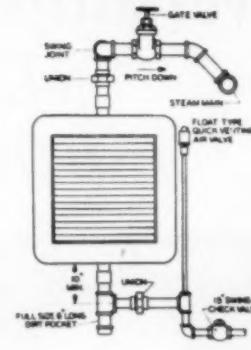
VAPOR OR VACUUM SYSTEM



HIGH PRESSURE GRAVITY



LOW PRESSURE GRAVITY



Types of Steam Systems

Vacuum System—Low Pressure: Condensate and air are removed from the heater through the return main by means of a mechanically operated vacuum pump. Air is discharged to the atmosphere; condensate to the boiler.

Due to the extremely close temperature range between steam and condensate, a bucket or float type trap is used for condensate removal. Thermostatic trap is used for air removal.

Two Pipe Gravity—Closed System—Low Pressure: In this system there is a definite steam pressure in the return main. This pressure, together with the static head between return main and the boiler water line, returns condensate to the boiler without mechanical means.

Return connection, on the return end of the unit, is usually controlled by check and gate valves, with air valve installed between the check valve and the unit for automatic removal of air. Air should never be discharged from heaters into the return mains of a closed gravity system.

High Pressure System: Operating pressure on this type system is usually 20 lb or more. Air is discharged through a hand operated pet cock; condensate through a high pres-

sure float or bucket trap to the return main. It is then discharged into the hot well or through the boiler return trap to the boiler—never directly from the unit to the boiler.

Two Pipe Gravity Open System: No pressure is maintained in the return main. Condensate flows by gravity to the pump or receiver, or hot well, and is discharged to the boiler by mechanical means.

On low pressure steam systems, air is removed from heater units either by automatic air valves, such as on the gravity system, or through thermostatic traps, as on the vacuum system, except that an open vent is installed on the return main. To eliminate any steam pressure in the return main, condensate is controlled by the float or bucket trap.

If desired, the same type of return specialties can be used on the vacuum system. On high pressure steam systems, air is removed through either the pet cock on the return trap or the open vent on the return main. This is so because float or bucket type return traps are designed to suit the pressure at which the system is to operate.

Unit Heater Controls

For maximum comfort and highest operating efficiency, unit heater systems should be automatically controlled.

The control used determines the flexibility of a unit heater system. Certain areas of a building can be controlled as a single zone thus providing for shut down in a particular area when it is not in use. In the same way, any zone can be heated for overtime or night shifts without heating the entire floor or building.

The two most efficient types of control systems are called "Modulating Control" and "On-Off Control." Modulating Control is the

more effective type because it allows the unit heater fan to operate continuously while throttling the steam supply to the heater.

On-Off Control stops and starts the fan or heat supply in response to changes in the area temperature. A thermostat starts the fan. A pressurestat is usually installed in the steam line or an aquastat on the return line. As a result, the fan runs only when there is steam in the main.

Modulating Control provides a constant discharge temperature, thus eliminating intermittent blasts of hot air. The continuous circulation prevents air stratification which would otherwise be present when the fan is off. However, Modulating Control is generally

well suited for only those installations where the unit heaters are located ten or more feet above the floor level. For installation less than ten feet high, Modulating Control may be a cause of drafts.

Modulating Control is accomplished essentially by a proportioning valve in the steam line which operates in response to a thermostat in the area. The fans may be run constantly or may be switched off manually when no heat is required.

Typical Installations

The typical installations described are based upon specific cases in which the products of many unit heater manufacturers have been used. These examples

FLIGHT LEVEL 25,000 FT.

CABIN LEVEL 8,000 FT.

In modern air-liners you breathe comfortably at altitudes of 25,000 ft., because your cabin is "Pressurized" — air pressure inside the plane is kept at or near normal sea level pressure.

Boilers, too, "breathe" easier when their combustion air is "pressurized" using forced draft

Cleaver-Brooks experience with thousands of steam boilers, of the self-contained type, has conclusively proven these operating advantages of forced draft:

- — because atmospheric boiler-room air is constant in temperature and therefore in density, the weight of air delivered for combustion by a forced draft fan is also constant and always gives proper air-fuel ratio (CO_2) resulting in maximum efficiency and freedom from combustion problems.
- — the electrical load, or power requirement, of a forced draft fan is at a minimum, because the fan handles a lesser volume of air.
- — low fan maintenance and longer fan life with forced draft fans since they operate with cool, clean boiler room air — no problems with high bearing temperatures and corrosion.
- — air is under pressure in the combustion chamber of a forced draft boiler, with no possibility

of "diluting" air entering the chamber. Maximum boiler efficiencies are always attained when head plates and casings are tight.

- — lower initial fan cost, better space arrangement, and better appearance are gained because forced draft fans are considerably smaller.
- — casings for forced draft fans are cool — require no insulation — contribute to safer operation and cooler boiler rooms.

Forced draft is one of many reasons why you get a greater return from your investment in a Cleaver-Brooks boiler — a boiler of foremost quality in every detail and with many immediate and long-range cost-saving features. Cleaver-Brooks self-contained boilers are available for oil, gas, combination oil and gas firing — 15 to 500 hp., 15 to 250 lb. p.s.i.

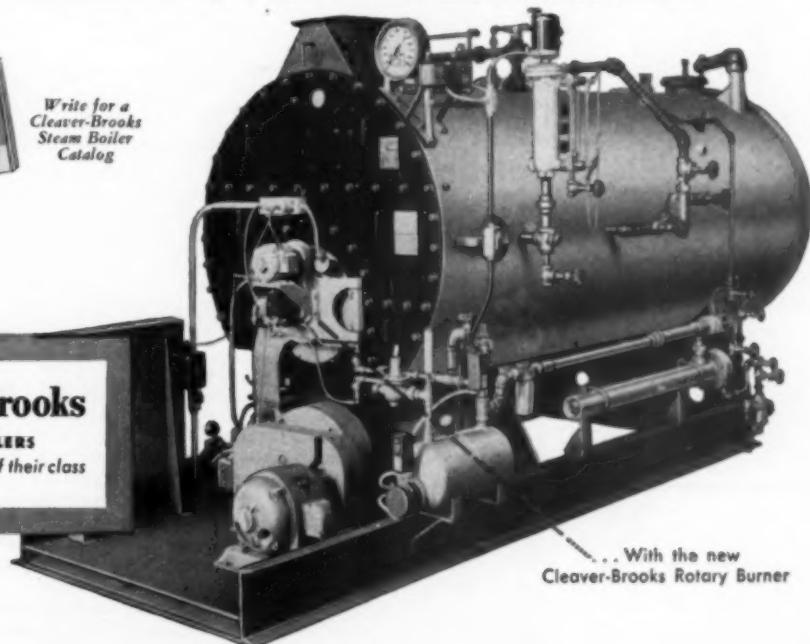
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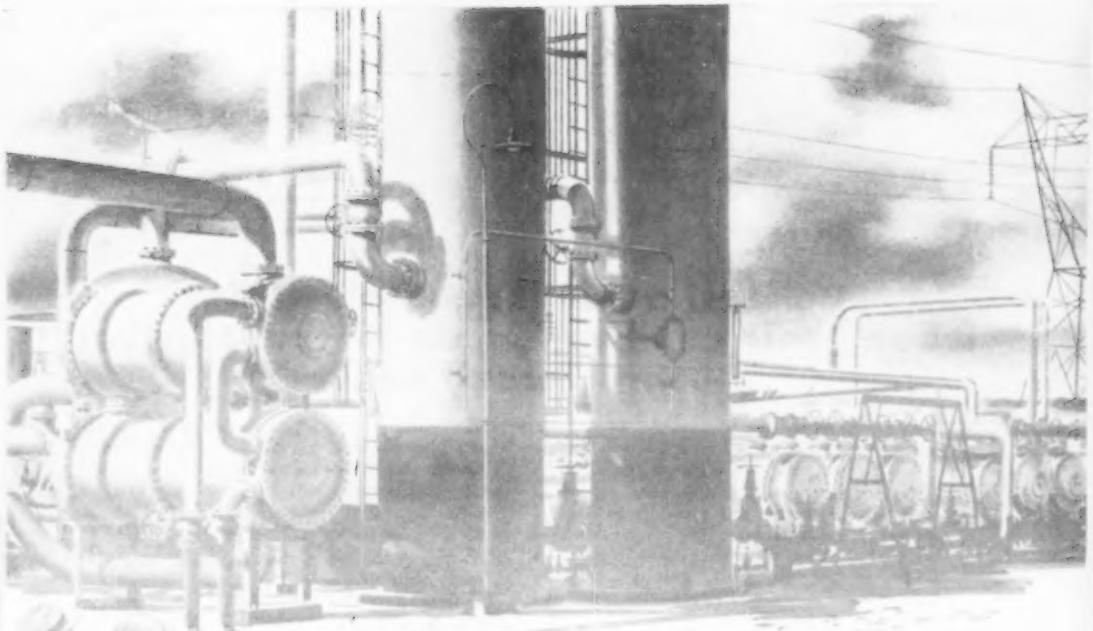


Write for a
Cleaver-Brooks
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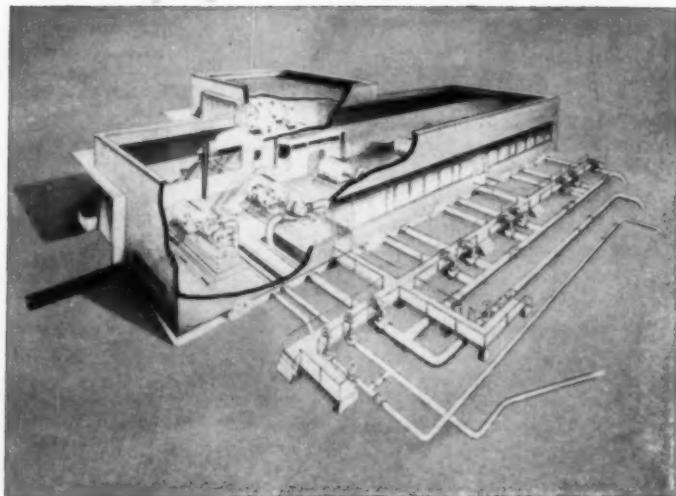
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STEAM BOILERS
the first and finest of their class





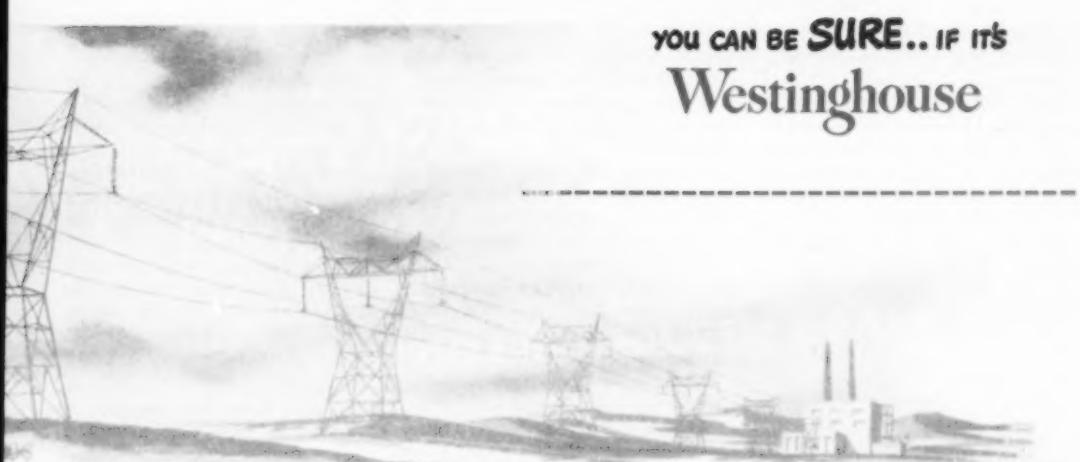
Cutaway drawing of typical pumping station on the new Ozark 22-inch pipeline.



OIL... More KW's to pump, pipe, refine it

Since 1939, the South's refining capacity has climbed 50%—and these refineries now buy more than one billion kwhr annually. Wells and pipelines use still more because electrification means big savings. Take the new Ozark "Big Inch" Pipeline. All the pumping stations have been completely electrified by Westinghouse—and the savings have been outstanding. Now, pushing a button causes a series of operations that quickly start the main pump units. In minutes, motors open valves that would take men an hour. And keeping this line at maximum through-put means \$50 a minute in revenue!

Shell Pipe Line Corporation, operator of the Ozark line, is an outstanding advocate of electrification. It pays about \$2,500,000 annually for cheap power.



YOU CAN BE SURE.. IF IT'S
Westinghouse

Why has Southern power consumption nearly tripled in ten years?

Ten years ago the watthour meters in the South registered 27 billion kilowatthours. In 1950 the total zoomed to a record-breaking 77 billion. That's close to a threefold increase in ten years—and a growth rate 36% over the U. S. average.

Why the big Southern increase? The chief reason: *industrial growth*. Industry uses three-fourths of the Southern power. And since 1939 the South's industrial output has climbed 248%. That's where the new kilowatts are going!

A basic element in this power and industry picture is the Westinghouse organization. Much of the South's electric power is generated by apparatus engineered by Westinghouse. And similarly, top-notch Westinghouse equipment helps growing

Southern industry USE this power to best advantage. The ultra-modern oil pumping station on the opposite page is a good example.

To better meet the needs of Southern power and industry, Westinghouse early built manufacturing plants in the South—which today are handy to the markets they serve, and the Southern markets they buy from.

As a southern supplier, customer, and producer, Westinghouse has a major stake in the South. Our policy will continue as before: developing Southern power, helping expand its use. And that makes your nearest Westinghouse office a good place to go when you want electrical help.

J.92006



Westinghouse
**A BASIC PART
OF THE SOUTH**



have been chosen to point out the range of unit heater installations possible.

Saw Tooth Roofs. In heating a room with saw tooth roof construction, the principal problem is to maintain a uniform temperature over the entire floor area, without hot and cold spots.

In the specific room being discussed, the vertical sides of the roof are largely of glass; the ceiling height is 15 ft.

The problem of spotty heating was solved by the installation of small vertical discharge unit heaters. Their capacity is equal to the calculated heating load for the roof.

These heaters are suspended one foot below the ceiling. An air diffusion device was hung from the base of the unit.

Cold air coming from the roof is thus heated by the unit and discharged horizontally in all directions. This warm air blankets the

roof area and stops cold down-drafts. Temperature control maintains uniform heat; irregular floor temperatures are avoided since hot air is not blown directly into the working area.

Standard horizontal discharge unit heaters are installed around the outside walls. These units have a capacity sufficient to take care of the wall, glass and floor heat losses, as well as infiltration losses from doors and windows. All outside doors are blanketed by streams of warm air.

Continuous Drying Processes. To dry strip tin plate in a continuous strip mill, a horizontal unit heater was installed on either side of the moving plated strip. Heated air blown by the two units effectively dries both sides of the tin plate.

Similar applications include the drying of pottery on a horizontal conveyor belt as well as tracing cloth, linoleum, dyed cloth, and

small parts on continuous paint spraying or dipping lines.

The amount of drying and the rate of travel of the process must be carefully considered in selecting the unit heaters to be used.

Spot Heating. Spot heating may be desirable in industrial plants and warehouses where workers are located at fixed points. Unit heaters with a large air volume should be selected and located so that the heated air blows directly toward, but not directly on the workers.

Vertical discharge heaters are particularly suited for spot heating. They should not, however, be mounted so high that they lose their heating effect to the surrounding air. They should be installed so that the greater portion of the discharged air hits the floor in the desired location.

Storage Warehouses. Low temperatures in warehouses are caused by the absorption of heat by materials moved from the outside to the inside. If a given warehouse temperature is to be maintained, all stored-up heat absorbing materials must be carefully considered.

To estimate the heat absorbing capacity of material, two temperatures must be determined: that of the material when it enters the warehouse and that temperature to be maintained within the warehouse. The temperature difference is then calculated.

The weight of the material being moved into the warehouse is determined next.

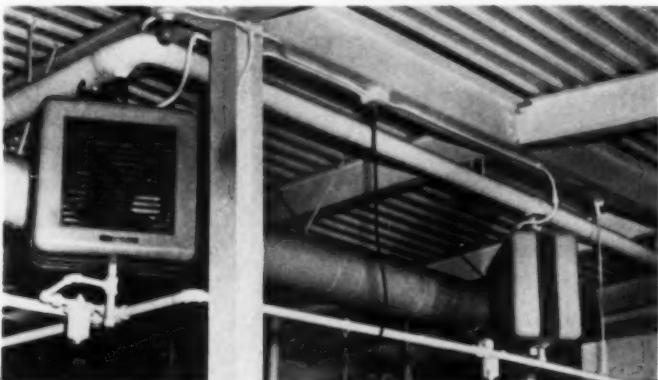
The Btu's required to heat the material is obtained by multiplying the weight of material by its specific heat and by the temperature difference.

In many warehouses, this load may exceed the normal heat losses of the building. To avoid heating all stored material at one time, portions of it may be covered or shielded by movable partitions.

The installations just described are only an indication of the efficient use to which unit heaters can be put. An almost unlimited variety of industrial applications are possible for many types of heating and drying processes, building and room heating, etc.

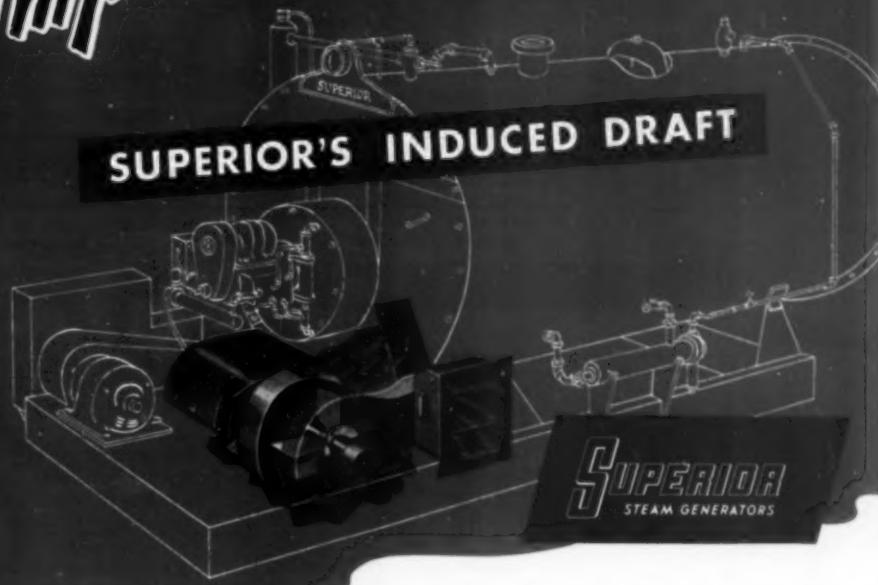


Horizontal and vertical discharge type unit heaters are shown in these American Blower Corporation installation photos. In the above view, a vertical discharge type heater with diffuser is installed so that heater does not extend below I beams. The horizontal discharge type heaters shown below complement each other for even temperature throughout the plant.



Improving a Proven Principle

SUPERIOR'S INDUCED DRAFT



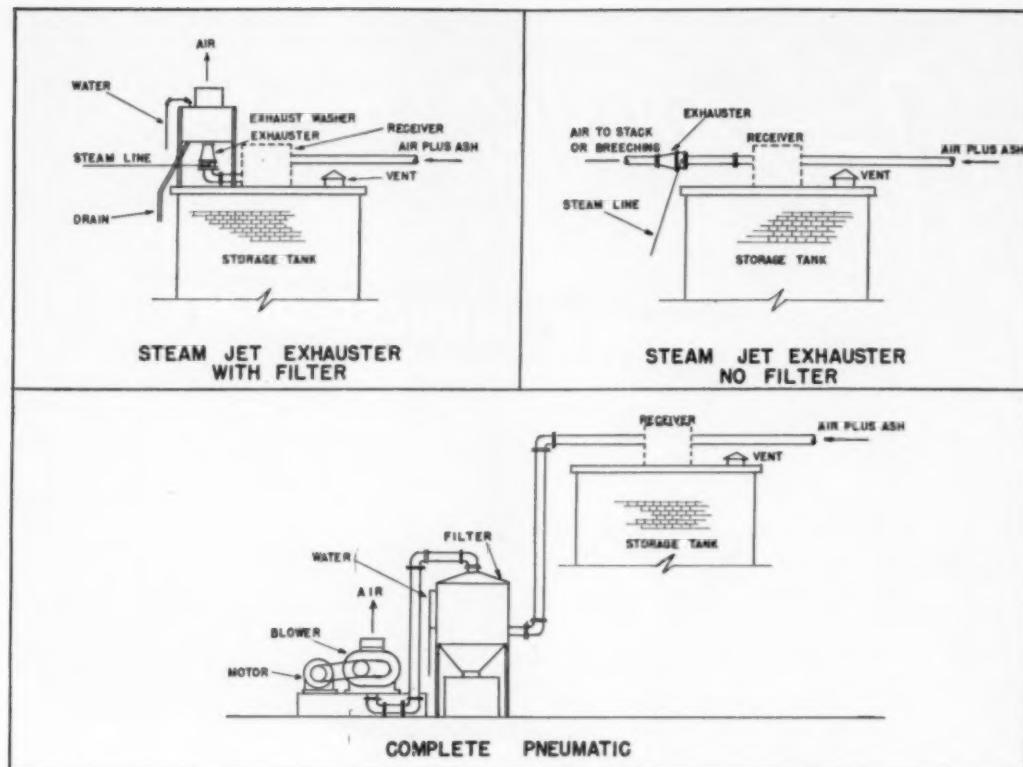
Built to operate on the same proven principle as natural draft, Superior's *Induced Draft*, because of its built-in design, low-speed fans, and unique construction, assures maximum boiler capacity at high efficiency. It provides accurate control of draft conditions without the usual disadvantages of mechanical draft. Cleaner, quieter, and safer in every respect, it represents but one of the many "Designed by Demand" features which contribute to the overall efficiency and long life of Superior Steam Generators.

Superior Steam Generators are shipped completely assembled, backed by undivided responsibility • Burn gas or oil, or both • 18 sizes from 20 to 600 b.h.p. for pressures up to 250 p.s.i. or for hot water • Write today for Catalog 311.

- Tailored to the demands of the boiler, and built-in, Superior's *Induced Draft* regulates the air necessary for efficient combustion. Leaves front platform clear.
- Full-width fan construction minimizes the danger of overworked or burnt-out tubes by providing an even draw across the entire tube area of the boiler.
- *Induced Draft* eliminates the danger of forcing the products of combustion into the boiler room to spread dust, dirt, and unhealthful air throughout the building.
- Especially-designed over-size fans run slower, minimizing wear and maintenance.
- Quieter, low-speed fans eliminate the high-pitched whine commonly associated with forced mechanical draft.
- Long-lived trouble-free operation assured by corrosion-resistant fans with outboard mounted bearings located out of the path of combustion gases.
- Eliminates the expense of a large chimney.

Superior Combustion Industries, Inc.

Factory: Emmaus, Pa.
Executive Offices: Times Tower, Times Square, New York 18, N.Y.



Diagrams showing arrangement of equipment for principal type of pneumatic ash conveyors

Pneumatic Ash Conveying

All types of dry ash, from fly to clinker, can be easily and efficiently handled in a pneumatic system. Low initial cost and simplicity of operation are advantages.

By A. W. JENKINS

LOW initial cost, simplicity of maintenance, flexibility of design and ease of operation, have made the pneumatic ash conveyor a product the modern power plant engineer accepts as a valuable auxiliary. It is applicable to any size boiler from the small, hand-fired unit through the pulverized coal-burning central station.

While there has been some reluctance about pneumatic systems for ash handling because of a belief that first cost was high, this

prejudice is not based on fact. Actually, this equipment is available at prices appreciably lower than competitive equipment.

The pneumatic conveying system is applicable to all dry granular material. Pipe size and commercial design prohibit the transporting of clinkers having a linear dimension in excess of three inches, but the temperature of the ash, except in the molten state, has little effect upon the efficiency of operation. It is merely necessary to

avoid allowing molten slag or wetted-down ash to enter into the conveying line.

Design

The pneumatic system induces air from the atmosphere into a continuous conveyor pipe line which delivers to a receiver or air-tight storage tank. This induction is actuated by either a steam jet exhauster or a motor-driven blower.

During operation, the exhauster continuously withdraws air from

within the system. At various points, usually adjacent to the furnace ash hoppers, sloping type T fittings are inserted in the pipe line. These fittings are equipped with plug covers which may be removed by hand. It is now customary to mount a grid-covered hopper of an approximately two square foot face area atop the intake fittings. The grid openings control the size of the ash being introduced to the system. Removal of any one plug offers an intake for the ashes, which are caught in suspension by the air flow and transported to the receiver or storage. At the receiver, due principally to the change in velocity, ashes are precipitated and the air continues on through the exhaust and filter.

Only one opening is used at a given time, for if more than one is used the opening nearest the exhauster will tend to break the partial vacuum and reduce the efficiency of the other intakes. Removal of ash from the storage tank is through a gate fitted to the bottom of the tank, to which is attached either a puddler unloader, or a gravity chute with water spray nozzles. The latter is considered the simpler method.

As has been stated, the choice of exhauster is not a single one, for in addition to the steam jet the rotary type exhauster is very efficiently and economically introduced.

The steam jet (or jets) is oriented in such a position that dry ash is deposited in the storage bin. The conveying air may then be discharged to atmosphere from atop the storage bin, or through the boiler stack. The type and extent of filtering depend on the characteristics of the ash being conveyed and the type receiver employed. If fly ash is being conveyed, alone or in addition to grate ash, the use of a filter is imperative.

An alternate method of operation places the steam jet in the pipe line at a point immediately preceding the line connection to the receiver or tank. When such an arrangement is employed the ash is conveyed absolutely dry up to the exhauster, but is then momentarily mixed with the steam,

Why a remote reading gage

- Most boiler drums are high—direct gages are far from operating floor.
- Obstructions often make gages hard to see—necessitate special equipment or frequent climbing to inspect.
- Saves thousands of steps, hours of valuable time. Brings gage reading down to eye level at safe distance from boilers.



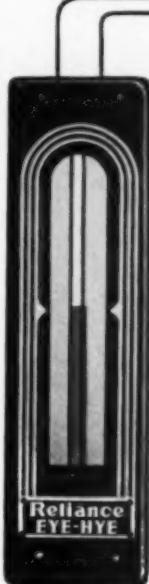
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- EYE-HYE assures perfect measurement, dependability and clear reading.

- All-hydrostatic principle—no mechanical parts—no adjustments on location.

- Reads in liquid, like a conventional gage, but easier, faster because of illuminated green indicating fluid.

- Oldest practical remote gage—nearly 9000 in use—on land and sea.



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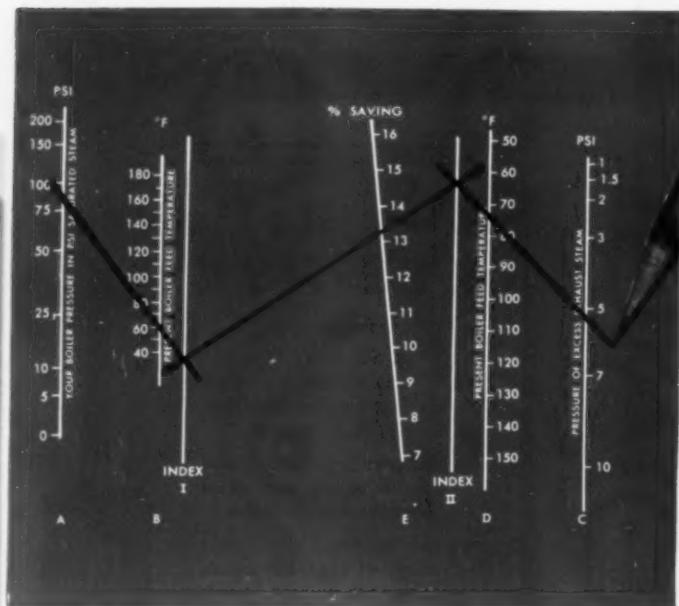
Reliance EYE-HYE

Remote Reading Gage

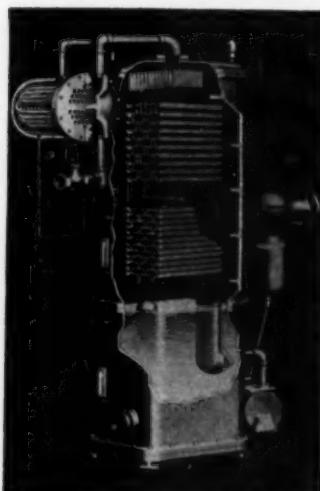
All-hydrostatic—Reads like a regular glass gage

Use this chart to figure fuel savings with a Swartwout Feed Water Heater

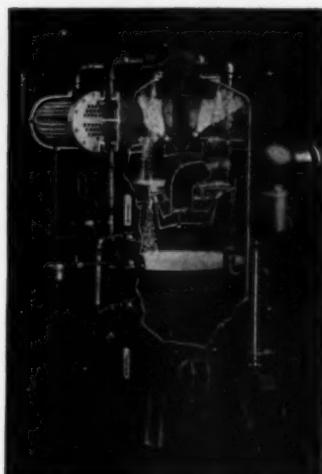
1 Here's how to figure your fuel savings with a Swartwout Feed Water Heater: Connect point on Scale A to point on Scale B and project line to intersect Index I. Connect point on Scale C to point on Scale D and project line to intersect Index II. Connect points on Index I and Index II and read percentage fuel savings on Scale E. The example given on nomogram—100 psi saturated steam boiler using 70°F feed water and 5 psi exhaust steam—shows a representative saving of approximately 13.6% of your present fuel cost.



2 By utilizing the residual heat in exhaust steam, Swartwout Feed Water Heaters can save you approximately 1% of your present fuel cost for each 11°F increase in boiler feed water temperature. In addition, you improve your boiler operation in other important, cost-cutting ways—faster steaming rate, temperature strain relief, removal by deaeration of soluble gases that cause boiler and economizer corrosion. Accessories are furnished to meet the requirements of each particular installation.



3 Swartwout cast iron or steel deaerating heaters (.03 oxygen guarantee) and deaerators (.005 oxygen guarantee) are supplied with cast iron or stainless steel trays. By using the counterflow principle the greatest degree of deaeration is obtained because the water is in contact with clean steam just before dropping into the storage section.



4 Swartwout all-steel spray heaters (atomizing type) give feed water with an oxygen content guaranteed not to exceed .005 cc per liter of water. All surfaces subjected to impingement of water are made of stainless steel. Swartwout heaters are specially engineered to your specifications.

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before and while entering the storage tank. The tank is vented to atmosphere, thereby permitting the escape of the transport air and steam. This type is often considered desirable for stoker fired ash; but it promotes some hardship where fly ash is handled, not because of transporting difficulty, but, rather, due to the moisture from the steam being absorbed by the fly ash with resulting packing within the tank. This promotes subsequent difficulty in discharging the contents of the tank.

The "completely pneumatic" system utilizes a motor-driven exhauster. The various characteristics of the steam jet system are applicable here also, with the exception that filters must always be used. This mechanical exhauster provides the most efficient pneumatic system, but the initial investment much exceeds the outlay required for a steam jet exhauster. This condition is offset by the fact that the efficiency of the mechanical system is considerably higher than that of the steam actuated system. Due to its ability to build-up more inertia force within the conveyor line, the motor-driven blower system is usually specified for the larger installations.

Component Parts

EXHAUSTERS—The selection of an exhauster suited to a system is most important. Besides the steam jet as against motor-driven choice, a further selection must be made between types of mechanical blowers. Of the two type mechanical exhausters manufactured, the plus pressure blower is preferable to the centrifugal blower. The plus pressure blowers are constant volume, variable pressure machines; centrifugal exhausters are constant pressure, variable volume machines and generally have maximum pressure ratings much below the positive pressure type. The pressure characteristics determine the ability of the exhauster to overcome flow snags; the constant pressure machine is less able to remove a clog in the air conduit.

PIPING AND FITTINGS—The nature of the piping used in the pneumatic transport of ash is an important item, since it is the

piping that necessitates most of the small amount of maintenance work required. Considerable metallurgical research has been necessary to evolve a metal that can stand-up under thermal stresses and intense abrasive action. The piping that best fills the qualifications is a nickel-alloyed cast iron. Also, the abrasive action of high velocity ash is so considerable that the force exerted by the change in momentum at elbows would, in an amazingly short time, completely wear through the fitting. This condition has made necessary the design of several unsymmetric type elbows.

INTAKE FITTINGS—Since all openings in the conveyor line represent points of ash influx, the intake fitting is employed to insure that the entry is made as efficiently as possible. The self-feeding ash intake with tapered plug, or control valve, allows the ash to fall into the air stream without the possibility of clogging. Design of this fitting is such that ash never completely fills the line to choke the air stream. Introduction of the ash through a vertical T fitting would present the possibility of clogging.

HANDLING FLY-ASH—If conveyor branch lines are used to reach points of relatively small fly-ash accumulations, such as in the rear pass of a boiler, the ash is dropped into the line through a T fitting equipped with a manually operated butterfly valve.

In the case of electro-static precipitators, where large amounts of fly-ash are present, an entirely different method of introduction is used. The ash travels from the precipitator hoppers to the conveyor line through rotary feeders, each hopper being served by a separate feeder. A percentage of the rotor compartments is blanked off in each feeder, and they are staggered in such a manner that at no one time does more than one feeder present an open compartment to the hopper ash. The rotary feeders are in series so that their activation is easily handled through the use of a common drive shaft. A gear motor supplies the power, and each feeder is linked to the

shaft through roller chain and sprocket connections.

RECEIVERS—The "cyclone" receiver was introduced about twenty years ago, and it was claimed it would discharge ash into the storage bin more efficiently than the older "direct discharge" type.

The ash laden air stream enters the "cyclone" tangentially, and due to the nature of the pneumatic conveyor system (minus pressure) the hinged gravity gate is closed. To discharge the ash content from receiver to storage bin, the exhauster is inactivated, thus causing an equalization of pressures on the gate. The weight of the deposited ash opens the gate, and the ash falls into the bin. A secondary separator has always been used in series with the "cyclone."

With "direct discharge" the storage tank proper is placed under vacuum. Ash is jettisoned directly to the tank through vertical piping, which projects downward through the receiver and terminates within the storage tank at a point twelve inches below the receiver connection. Horizontal baffling is placed at the receiver connection.

Many claims are made for each type. Certainly the "direct discharge" method has the advantage of simplicity, but it has not been proved that either surpasses the other in operation. Perhaps the only exact statements that may be made for each are that the "direct discharge" receiver allows continuous conveying, while the "cyclone" produces interrupted conveying.

DISCHARGING EQUIPMENT—Storage tank ash may be discharged to a vehicle through a puddler unloader or by means of a fabricated steel chute designed to accommodate a water line and nozzles.

The puddler unloader is braced directly beneath the storage bin. In appearance it is a rotating cylinder with an axial length ranging from four to eight feet and a corresponding diameter of thirty to forty inches. The ash is discharged into the upper end of the sloping mechanism from the tank and is puddled, as a result of water in-

ection, along its rotating path to the discharge end.

The steel chute with water spray seems to serve as well, and initial investment and maintenance costs are lower.

FILTERS—The type of filter used is almost entirely dependent on the nature of the ash being conveyed and on the type receiver employed. If only fly ash is being handled, a cloth filter may be satisfactory, but when larger ash particles are introduced into the system, this type of filter is inadequate. Clinkers retain their heat so long that in addition to the danger of piercing the filter, they may also burn the cloth.

Filtering is always employed in conjunction with mechanical exhausters to protect the fan from abrasion.

A highly efficient filter is the mineral-bed type. With this type the conveying air is made to penetrate a bed of crushed stone through which water is continually cascaded. The mineral-bed filter is often employed with the mechanical system.

STORAGE BINS—Regardless of type, the bin should be of a size sufficient to provide a storage capacity equivalent to the plant's accumulation of ash over approximately a three day minimum period because trucks to move the ash may not be available over weekends.

Cylindrical bins of hollow tile or steel plate are used. In some cases, a room is built into the boiler house and the ash is introduced into the room through a receiver which is placed on the roof.

Generally, the hollow tile storage tank is supported on structural steel columns which are secured to reinforced concrete footings. Atop the supporting stand a beam-reinforced concrete base slab, with tile filler, is poured. An aperture is left in the slab to accommodate the rack and pinion type discharge gate, and chute. The hollow tile is then laid from the base with a pair of semi-circular hoop bands imbedded in each horizontal mortar joint. Guard rails and a ladder will facilitate maintenance. If the bin itself is under vacuum the seal is improved

by giving the interior a coat of cement wash. The average pressure drop of such a tank is less than one two hundredths the magnitude of storage tank vacuum.

Steel storage bins are supported on standard structural beams and are welded air-tight throughout. In the steel bin, as well as the tile, a vent may be introduced into the roof.

Costs & Capacities

A review of many existing installations shows that approximately 300-400 lb steam consumption, average, is required to handle a ton of ash. The corresponding power needed for the motor-driven exhauster is approximately two and one half brake horsepower hours. Average velocity of ash flow is 5000 to 8000 fpm.

While capacities vary with type of ash being handled and the physical design of the system, steam system rates average from five tons per hour in six inch lines to twenty tons per hour in twelve inch lines. Mechanical exhauster

systems handle greater capacities. The rate of conveyance of fly-ash alone will be roughly one and one half times as great as for the average ash.

Of course, pneumatic ash systems do not compete only with hand removal. The pneumatic system's most obvious advantage over the mechanical system is the fact that at no time does the ash come into contact with a moving part, thus the possibilities of maintenance interruptions is reduced.

Hydraulic ash disposal is ideal in some instances, and pneumatic systems must be compared with these. The major handicap for the hydraulic system lies in the fact that water must be relatively cheap and there must be some way to economically dispose of the discharge. There is also the problem of excavation to be considered with the hydraulic system. The pneumatic system can be, and is, used in downtown sections of cities and towns where the water disposal problem with a hydraulic system would be serious.



Boiler Settings Fall Inward

THE question has frequently been asked us, "Why do the linings of my settings always fall inward and why do the outside redbrick fall outward?"

The theories and answers we have heard are as wide and varied as the old question "How old is Ann?"

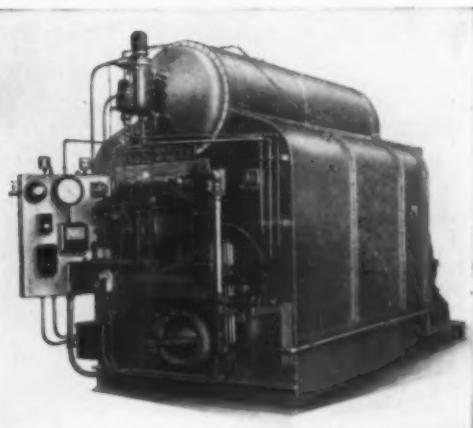
Our cartoon characters advance one theory. We of course have another. It would be interesting indeed for the readers of this article to write to SOUTHERN POWER & INDUSTRY giving their thoughts.—GEORGE P. REINTJES.



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Helping the MAN-IN-THE-PLANT

"Fish-Pole" Height Gage

UNTIL Don Stewart, Potomac Edison System Distribution Department Inspection Engineer, devised a unique "fish-pole" measuring device, one of the most tiresome, time-consuming jobs was checking the height of company wires which cross roads.

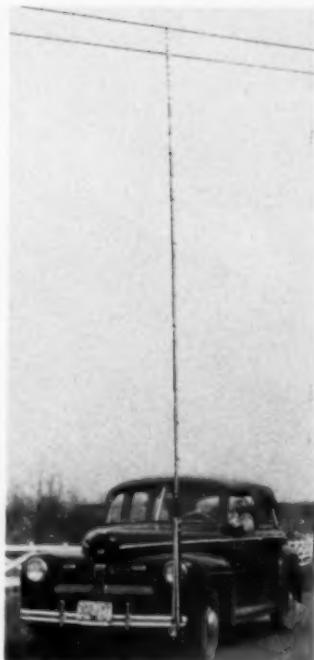
Mounted on the front bumper of a car, the pole has caused much comment and queries have poured in wherever it has been used.

The pole reaches a height of 18 ft for measuring guys, telephone and lower voltage electric wires. By pulling a rope, the car's driver may raise the pole to 20 ft for checking wires that carry from 750 to 15,000 v. The top three feet of the pole are marked off in

six inch intervals by tape or alternate bands of color so the approximate height of wires can be determined in those cases where clearance is too low.

A small weight at the bottom of the pole and a coil spring hold the pole in a vertical position while wire heights are being checked. The pole lays back parallel to the car when moving at higher speeds or when passing under trees, through underpasses, tunnels or other overhead obstructions.

The National Electrical Safety Code specifies the proper height of road-crossing wires. Stewart and his crews have found this method much more efficient than the old tape line.



Using this "fish-pole", a two-man crew of The Potomac Edison Company, Hagerstown, Md., checked 7,982 crossings in 16 days, an average of about 500 crossings per day.

Magnetic Separators Reduce Fire Hazard

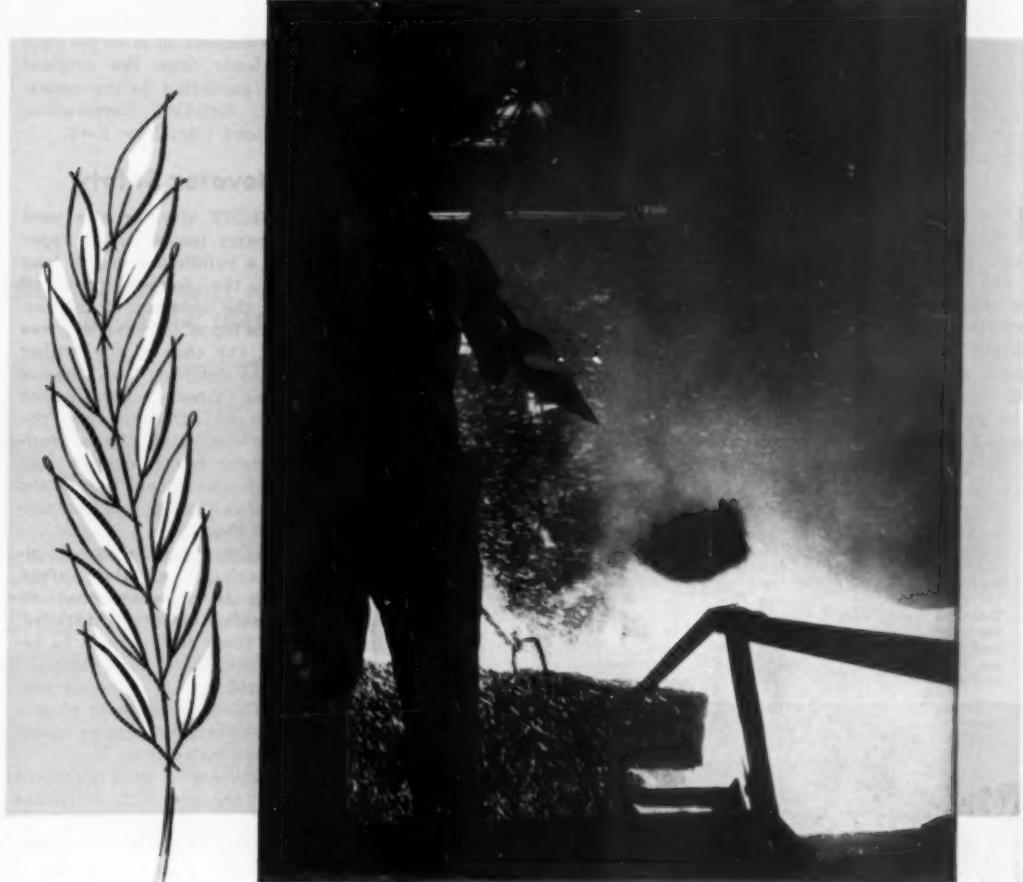
THE Appleton Company, Anderson, S. C., one of the country's largest producers of cotton flannels, uses a magnetic separator for protection from fire and from machinery damage.

Unit is installed between the bale breaker and vertical opener. It catches clips, nails, bolts and other metal impurities which, if not taken out, might strike a spark, causing a fire or machinery damage.

Separator is designed on the flow-interrupting principle. As material being cleaned changes direction, because of the hump shape of the unit, a tumbling or mixing action is brought about. This breaks up the flow of material and gives one of the two magnets an opportunity to remove the tramp iron.

Consisting of two permanently magnetized Alnico magnets inserted in a rectangular sheet metal housing, the Eriez Magnetic Hump Separator, made by the Eriez Manufacturing Company, Erie, Penna., is completely non-electric in operation and may be used in pressure-tight or liquid-tight lines.





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Speeding Thread-Repair Operations

Stainless steel wire-insert method has proved efficient in its consumption of time, labor and materials.

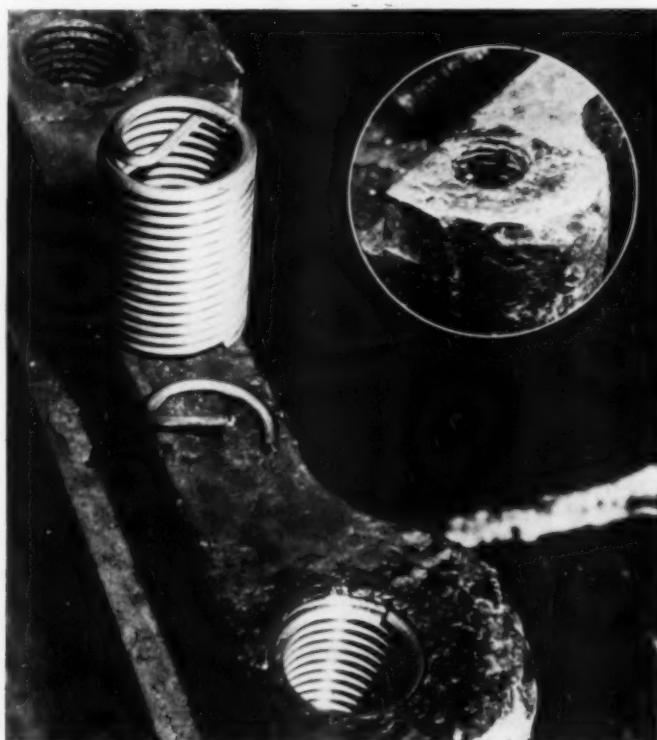
IN comparison with three other thread-repair operations previously tried in a large repair shop—the oversize-thread, the build-up by weld, and the solid-bushing method—the wire-insert method of thread repair has proved to be the most efficient in its consumption of time, labor and materials and the most effective in producing a permanently-repaired thread.

In operations on heavy electric

motor castings the repair shop claims the new threads are stronger and more wear-resistant than original threads and are installed in 80 per cent less time than conventional repair methods require. Cost savings as high as 60 per cent are claimed.

Installation procedures are illustrated. Because these precision-formed coils of diamond-shaped 18-8 steel wire provide higher

The unmounted thread insert, top left, with a free diameter slightly larger than the receiving hole, is self-locking when positioned in the hole, yet may be removed with another tool. The installed insert, bottom center, is properly positioned below the casting surface and has had its notched inserting tang removed with a tang break-off tool.



thread-flank engagements, the threads in the repaired hole can safely withstand 20 to 30 per cent higher loads than the original threads, according to the manufacturer, Heli-Coil Corporation, Long Island City, New York.

Elevator Safety

AFREIGHT elevator was used to carry lumber to an upper floor of a building. Being in long lengths, the lumber projected through the open top of the car. When the top of the shaftway was reached, the ends of the lumber struck the shaftway roof. The car continued upward, the lumber buckled and splintered and the operator was killed. Similar accidents occur too frequently and stringent maintenance and safety precautions would prevent the majority of them.

Three steps must be taken to insure maximum elevator safety. First, it is necessary that all needed safety devices be installed. Second, these devices must be retained in use, and the equipment maintained in safe operating condition. Third, a rigid code of safe elevator operation must be established and maintained.

A safety survey by a competent elevator engineer will determine what additional safety devices or equipment, if any, are needed. Many elevators are fully equipped with safety devices, but often some of them are not utilized.

To insure against operation of the elevators with safety devices bypassed, a daily inspection should be made of each elevator. This will not consume a great deal of time, but it will be of valuable aid in preventing accidents. Depending upon the elevator's safety equipment, each shaftway door or gate, car door or gate, and the door and gate circuit emergency cutout device should be checked, and if found to be defective, restored to proper operating condition before the elevator is permitted to be used.

Records of safety inspections, repairs, etc. are necessary as a means of preventing neglect. Such records may be kept in the form of a wall chart or loose-leaf book, the former being more convenient.

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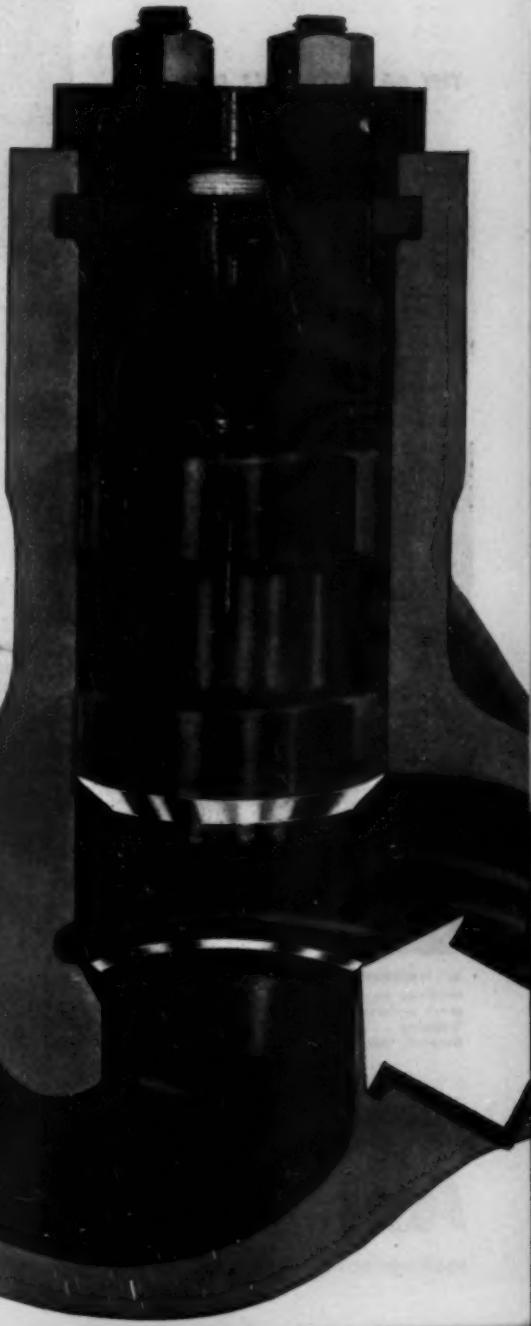
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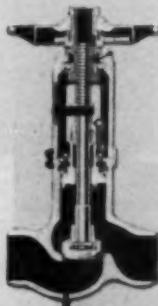
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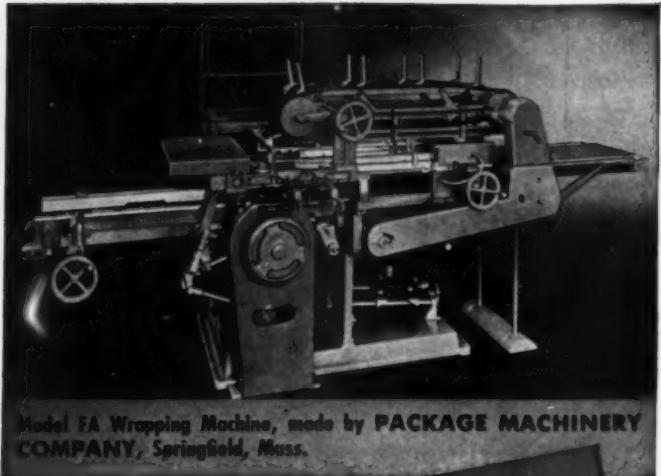
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spection should be made of all elevator equipment relating in any way to safety. Where a number of elevators are in use, the work may be scheduled so that certain elevators are inspected each week.

One of the most effective aids to elevator safety maintenance is equipment cleanliness. Apparatus jammed with dust and trash cannot be expected to function properly, and this encourages efforts to bypass safety devices. In one plant the gate tracks of a freight elevator were permitted to become choked with sawdust, to the extent that the gates could not be closed sufficiently to operate the gate circuit switch. The workmen eliminated this difficulty by the simple expedient of propping the gate switch closed with a stick. It was then no longer necessary to even close the gates in order to operate the elevator.

Monthly Inspections

The principal equipment to examine in the monthly safety check-up is, in general, as follows:

Car switch or controller. If this is of the safety grip or latching type, see that it cannot be operated accidentally due to wear or failure of the latching means.

Emergency shaftway door and car door or gate circuit cutout switch. This is usually a push button switch inside the car. It should be protected against unauthorized use by a glass cover. The switch may be tested by opening the car gate or door slightly while the elevator is running. Failure of the car to stop immediately will indicate a defective switch or circuit. This may be due to a ground, short-circuit or welded switch contacts.

Car doors or gates. In addition to testing the doors or gates by opening them slightly while the elevator is running, a test should also be made to see whether the elevator can be started while a door or gate is open. In each case, the operating circuit should be broken before the door or gate opens sufficiently to be hazardous.

Shaftway doors or gates. Each such door or gate should be tested individually; first, to see whether the car can be started while the door or gate is open, and second, to determine whether opening the

door or gate will immediately stop the elevator. In some cases, the maximum distance that a shaftway door should be permitted to open before interrupting the elevator control circuit is stated by the manufacturer of the door switch. In some types of door switches the circuit is broken when the door is unlatched, before it moves at all. However, the safest door switch adjustment is that which will not permit the door to pass the edge of the frame before interrupting the circuit. This precaution, if made possible by the design of the door and the switch, will eliminate the possibility of the door being prevented from closing, after the circuit has been completed, by someone outside the door.

When testing car and shaftway doors or gates, always employ the slowest possible car speed, and be sure the elevator is on hand control; never selective control, automatic or self-landing. Care is necessary to avoid injury, particularly when testing the shaftway doors or gates. Suitable additional precautions are necessary when testing push button elevators that function without an operator.

Car and shaftway door or gate tracks, guides and fastenings. These should be carefully checked to see that none are excessively worn, loose, broken, defective or missing. Lower guides of both car and shaftway horizontal doors or gates are especially susceptible to wear and frequently require replacement. One industrial plant found that both lower guides were missing from a shaftway door on a high speed, self-landing elevator. Had the car, when traveling upward, struck the lower edge of this free-swinging door, the results might very easily have been tragic, since the door would undoubtedly have buckled inside the car.

Thoroughly examine door and gate switches, closers, and power operators, to see that they are secure and function properly. A broken or weak door closer spring may permit a shaftway door to drift open after it has closed and the elevator has departed. This is an especially dangerous possibility and one which should be guarded against. The use of door closer arms of a type that will close by

**IN ONE STAGE
IN ONE HOUSING**

Reduction ratios of 1:1 to 50,000:1

Here's a design that is unique among speed reducers... the Winsmith Patented Differential Gear. And it's unique in many respects — all of them of major importance to machinery builder and user alike.

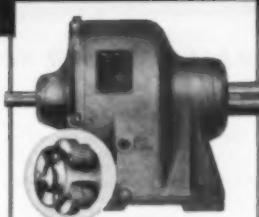
In a single stage, in one housing (which may be the horizontal, vertical or flange-mounted type), reduction ratios of 1:1 up to 50,000:1 are achieved smoothly and silently... *without additional parts!*

The heart of the Winsmith system is a 6-gear planetary element, free within the reducer housing to float into the most equalized load-distributing position, thereby assuring even wear, automatic compensation and alignment, smooth and quiet operation.

To be fully familiar with Winsmith Patented Differential Speed Reducers, as well as the features of the worm and helical lines, write, requesting "Save Through Standardization" Folder. It sums it all up very briefly.

WINFIELD H. SMITH CORPORATION

305 SPRING ST.
Springville (Erie County) N. Y.



HORIZONTAL TYPE
1/10 to 82 hp at 1800 rpm



FLANGE-MOUNTED TYPE
1/10 to 50 hp at 1800 rpm



VERTICAL TYPE
1/10 to 82 hp at 1800 rpm



ONE BASIC PUMP SERVES TWO DIFFERENT NEEDS

This heavy duty, single-stage, single-suction pump handles pulp stock and acid or liquor . . . easily converts to meet production changes or replacement needs.

QUICK CONVERSION FROM ONE JOB TO ANOTHER!

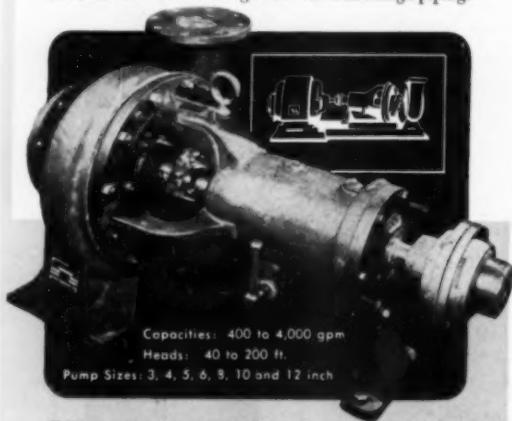
Converts from pulp stock handling to acid-liquor service by merely changing a few pump parts. For hot service, a water-jacketed stuffing box is easily added.

SMALL NUMBER OF SPARE PARTS SERVES MANY PUMPS

By standardizing on these pumps, you also economize on spare parts—a small number of interchangeable parts protects a large number of pumps.

EASILY REPAIRED WITHOUT DISTURBING PIPING

Dismantling is simple. Entire bracket, rotating element and pump cover can be unbolted and lifted free from the case without disturbing suction and discharge piping.



STANDARDIZE ON THE

B.J. PULP
PUMP

for pulp stock and acid or liquor handling

Byron Jackson Co.

Since 1872

P.O. Box 2017 Terminal Annex, Los Angeles 54, Calif.
OFFICES IN PRINCIPAL CITIES

For full details, write for Bulletin No. 48-9000

PROFIT by the EXPERIENCE of America's FINEST PLANTS

They REPEAT-ORDER
HOFFMAN Heavy-Duty
VACUUM CLEANING EQUIPMENT
for Wider Range Dust Removal!

One installation sells another, as plant after plant finds that Hoffman vacuum cleaning units save labor—salvage material—reduce product defects—eliminate dust hazards. They've proved that they can clean larger areas of walls, floors and overhead surface with Hoffman equipment. Built to provide bigger capacity, higher vacuum and long years of service on the most grueling plant cleaning jobs.



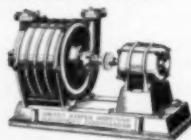
YOUR CHOICE OF 4 BIG-CAPACITY PORTABLES

Advanced design and construction features for fast, efficient cleaning, with one-man handling. 1½, 3, 5, and 7½ H.P. models to match your specific cleaning requirements

STATIONARY SYSTEMS IN A WIDE RANGE OF SIZES TO FIT YOUR MAINTENANCE OR PRODUCTION OPERATIONS
Provides cleaning in several areas at the same time. Sweepers attach cleaning hose to conveniently located inlets (in a permanently piped system). Dust is removed pneumatically to central collectors for easy disposal.

MULTISTAGE CENTRIFUGAL BLOWERS AND EXHAUSTERS

For agitation of liquids, combustion, mixing—for all air requirements (including the elimination of compressed air). No internal moving parts. Low power consumption. Adopted as standard in steel plants, textile and ice plants requiring 24-hour continuous service. Wide range of pressures, capacities and vacuum, for air or gas. Tell us your requirements.



AIR APPLIANCE DIVISION **U.S. HOFFMAN** MACHINERY CORPORATION
32 EAST 32nd STREET, NEW YORK 3-N.Y.
CANADIAN PLANT: CANADIAN HOFFMAN MACHINERY CO. LTD., NEWMARKET, ONT.

gravity in the event of closer failure is one means of accomplishing this.

All apparatus friction points requiring lubrication should be lubricated with the proper grade of lubricant. This is important since sluggishness of operation can prevent safety devices from functioning properly.

Car safety. The car safety rail clamp mechanism should be examined for proper shoe clearances, security of parts and adjustments, and sufficient lubrication of pivot points. See that the operating cable is not loose, tangled, kinked or damaged. Sometimes rust or corrosion, caused by spillage of liquids transported in the car, will damage the safety parts or render them inoperative. It is very important to examine the cable closely for such defects because a weakened cable may fail at the critical moment when needed.

Hoist, compensating and governor cables. These should be carefully checked over their entire lengths, and special attention given to those sections that pass over the sheave wheels more frequently due to service conditions. The cables should be examined for excessive wear, broken wires, rust or corrosion, or any other defect that might be present. Cable inspection may be made by riding the roof of the elevator car while it is moving at slowest speed. The use of a very loose fitting cotton glove is helpful in detecting broken wires, since the wire ends will usually snag the material. Care must be taken, however, not to grip the cables as it is easy to thus be pulled off balance.

Generally a cable is considered safe as long as it is in good condition, not too old or subject to rust or corrosive fumes, and has no more than one broken wire per strand in any one-foot section.

Check the ends of all cables carefully where they enter sockets or are otherwise fastened. It is not unusual for failure to occur at this point due to crystallization of the metal. See that all fastenings are tight, and if an equalizer is employed, that it is not defective in any way and its bearings are well lubricated.

Examine the clamp holding the

governor cable-safety cable block and make sure the safety cable is not tangled in any way.

Electric cables. These cables should be checked for damaged insulation or other defects. It is possible for a short-circuit in a control cable, due to defective insulation, to cause false operation of the elevator or to prevent quick stopping in the event of an emergency.

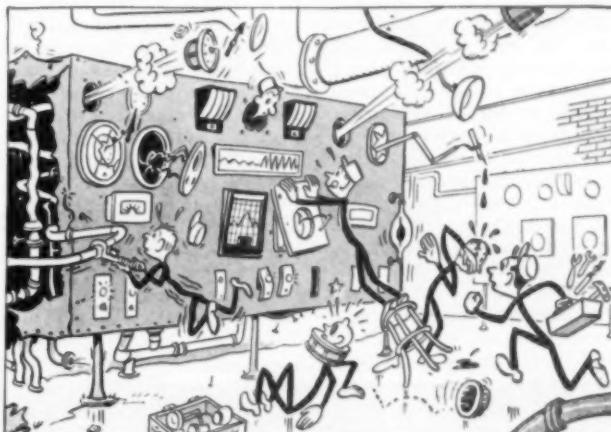
Defective cable insulation should be repaired, and after any necessary wire splices have been made the break in the cable cover should be replaced with two layers of friction tape. Any sharp or abrasive objects in the shaftway causing cable damage should be removed or covered.

Governor. Examine the governor

for proper lubrication, excessive bearing wear, defective or loose parts, and for any indication that its adjustment has been tampered with. Also see that there are no nearby objects that might interfere with its operation.

Sheaves. Check sheave bearings for adequate lubrication, excessive wear, and end play. See that there are no defects in the sheaves or other parts that can cause cable wear or other troubles. One hoist machine sheave, upon examination, was found to be cracked through, the parts being held in place by the fall wrap of the hoist cables.

Slow down and limit switches. Examine the operation and the various parts of all car slow down and shaftway travel limit switches. See that bearings are properly lu-



Plant With The Jitters from "Bouncing Pipes" by the Burgess-Manning Company.

Burgess-Manning Expands Dallas, Texas, Operation

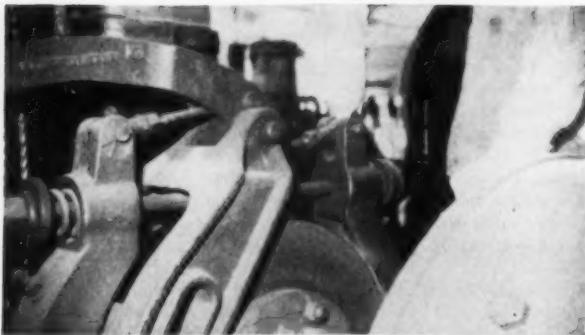
The new petroleum-chemical headquarters of the BURGESS-MANNING COMPANY of Libertyville, Ill., have been established at 1203 Dragon St., DALLAS, TEXAS. R. L. LEADBETTER, vice president is in charge of the Dallas operation. STEPHEN G. PADDOCK is manager of sales. Other recent additions to the Southwestern office are R. H. CAMPBELL, purchasing agent and traffic manager; W. C. JACK, design engineer; and R. T. OLIVER, sales correspondent.

Burgess-Manning Co. are the originators of the "snubbing" principles to reduce noise from engine exhausts

and compressor intakes and pioneers in surge control of gas and air piping systems.

Fields of application are oil and gas production, gas transmission and distribution, manufactured gas industry, chemical industry, and all industries handling air, steam and refrigerants.

The illustration is from Burgess-Manning's "Bouncing Pipes," a booklet which in the language of the layman, tells the story of surge control in gas and air piping. Copies are available on your letterhead from the Dallas, Texas, office.



Adjusting Elevator Brake Shoe Spring Pressure

bricated and that none of the parts are loose, damaged or broken. On gear type car slow down switches, be sure the gear teeth are free of debris. A metal cover is helpful in keeping trash out of the gears. It can be removed for gear tooth lubrication when necessary.

Rails and shaftway hardware. Check rail joint fastenings and other iron-work in the shaftway to see that there are no loose parts. Also make certain that the counterweight fastenings are secure. The writer recalls a serious accident that resulted from unsecured counterweights. A newly installed elevator was being operated by the construction crew, who had not yet finished the job. As the car descended and the counterweight frame ascended, one of the coun-

terweights that was setting in the frame struck a projection in the shaftway. This tilted several of the weights from the frame, allowing them to hurtle down the shaftway, to land with death-dealing force on the three occupants of the elevator car far below.

Car. Examine the car on top, bottom and sides for loose parts, rust, corrosion, or any other defect that would render the car unsafe. It is not unusual for car gate fastening bolts to loosen and drop out of position, thus permitting the gate to move about at will. Wood is employed in the construction of some car floors. Such floors should be watched for rotting or splitting of the wood.

Brake, control equipment and power apparatus. These should be

carefully checked to determine whether all parts are operating properly. Special care should be taken to see that all brake fastenings are secure, adjustments undisturbed, bearings properly lubricated, and that no part is sluggish in operation. Check for excessive lining wear, rubbing of lining rivets on the drum, and weakness or breakage of springs. Any such faults found should be corrected.

Semi-Annual Inspections

Every six months, each elevator should be given a load test. The car should be loaded with a weight equal to carrying capacity plus 20 per cent. Elevator test weights are convenient for this purpose. Tests should first be made at the lower end of the shaftway until it has definitely been established that the brake and power adjustments are correct to handle the load.

Yearly Inspections

Once a year, a governor test should be applied to each elevator by competent mechanics employed by a reputable elevator company. After the satisfactory completion of each test, the governor tripping adjustment should be sealed with a seal made for this purpose. As long as this seal remains unbroken, it is a guarantee that the proper governor adjustment has not been changed.

The cost of yearly governor tests

Check Governor Cable



Check Compensating Cable



Check Shaftway Door Closers

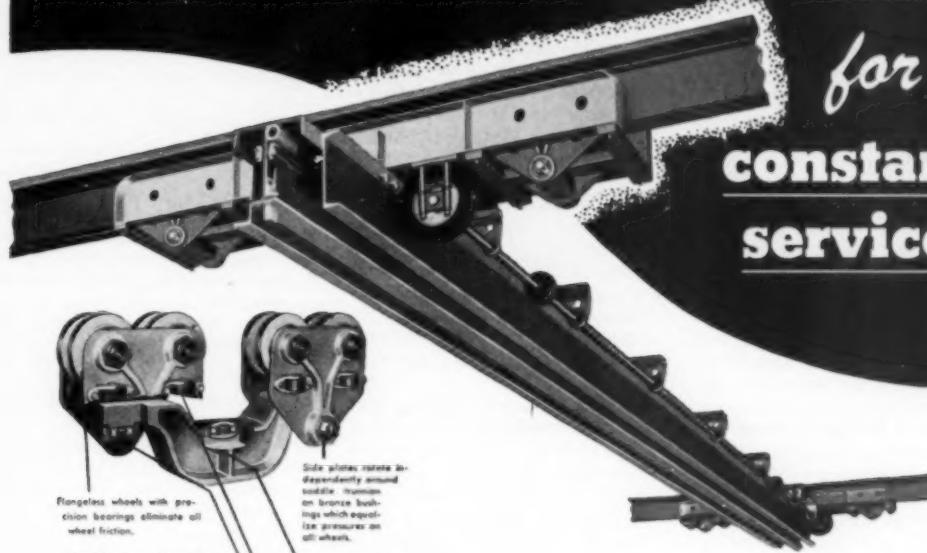


Check Pit Buffer



AMERICAN MONORAIL CRANES

for
constant
service



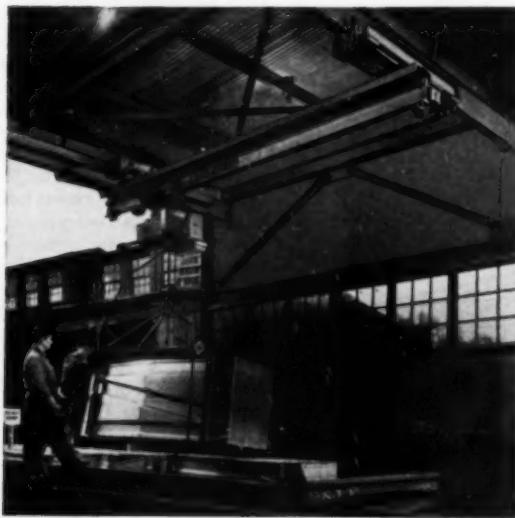
Flangeless wheels with precision bearings eliminate all wheel friction.

Load bar is seated in saddle bearing on Timken self-aligning bearings.

Side rollers with anti-friction bearings hold trolley in positive rail alignment.

Side saddle carriage allows heavy arm load to run on bronze bushings which equalize pressures on all wheels.

End truck supporting end saddle is seated on Timken self-aligning bearings.



Only two men are needed to transfer bundles from shipping rooms directly into gondola cars—a saving of 32 man-hours per shift over previous method. This crane is in constant service. The secret of its success is Articulated Trolleys.

When each trolley wheel carries its share of the load in perfect alignment with the craneway tracks and all possible friction is eliminated, the result is perfectly articulated trolley travel.

Applied to American MonoRail Cranes, these articulated trolleys permit constant operation—handling loads up to 10 tons. And with this is offered all the flexibility of MonoRail design for interlocking carrier service between and beyond the craneways.

Let an American MonoRail engineer explain all the advantages of these new cranes, or write for complete information.

THE AMERICAN **MONORAIL** COMPANY

13105 ATHENS AVENUE

CLEVELAND 7, OHIO

SOUTHERN POWER & INDUSTRY for AUGUST, 1951

is well justified when it is considered that this is, in effect, insurance on elevator safety. If the elevator controls fail, or the cables break, the governor-controlled safety will prevent an accident—if it is in operable condition.

The importance of annual governor examinations is exemplified by the case of a 22 story building, in which the elevator governors were first given such a test fifteen years after the elevators were installed. It was found that, due to a construction defect in one of the governors, it was impossible for one of the jaws to trip and clamp the cable.

Buffers. The liquid level in hydraulic counterweight frame and shaftway pit buffers should be checked every six months to determine need for additional liquid. The buffers should also be examined to see that the plungers are not stuck or jammed in depressed position, thus rendering them wholly or partly inoperative. Be sure to use only recommended liquid in buffers.

As an added precaution post an operating procedure and safety rule notice in each elevator car.

Much can be done to improve the safety of elevators if a careful study is made of each installation. The cost of safety equipment is usually very moderate in comparison with the benefits obtained.

First in importance are the mechanical cables. It is poor economy, and definitely unsafe, to keep cables in service after they have developed enough wire breaks to justify their replacement. For even if the failure of such cables does not result in dropping of the car, the writhing broken cable or cables can be dangerous and destructive in their plunge down the shaftway, perhaps even entangling adjoining elevators.

Shaftway doors or gates that cannot be opened from the outside, which must be closed and latched to complete the elevator operating circuit, and which prevent access of objects into the shaftway when they are closed, are invaluable in promoting elevator safety.

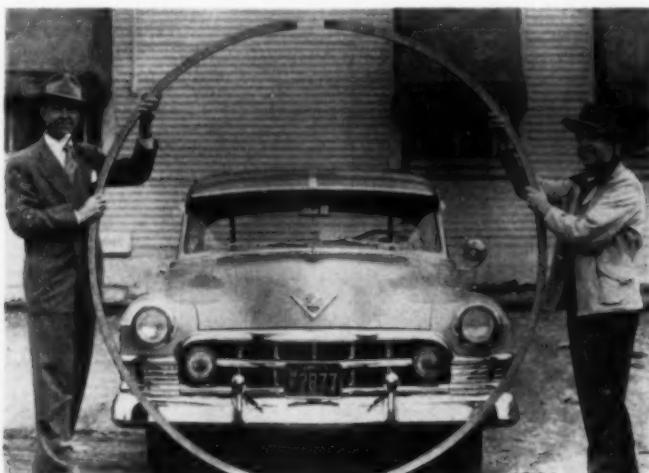
Piston Ring from Texas

This 83-in. piston ring is one of an increasing number of large rings which the Double Seal Ring Company of Fort Worth, Texas, is producing for the large piston engines and compressors used in heavy industry.

Holding the cast iron, step cut ring, which weighs about 200 lb, are Double Seal's president, Henry S. Green, left,

and vice-president and general manager, William T. Green.

The pictured ring is one of several manufactured for use in a steam hydraulic intensifier in a United States Steel Corporation plant. The company regularly turns out rings as much as 96-in. in diameter, and Double Seal officials believe their firm holds the record for producing the largest ring ever made, 108-in. in diameter.



Operating Instructions

To start car

1. Close shaftway and car doors.
2. Move car switch in proper direction.

To stop car

1. Slow car to lowest speed before floor is reached.
2. Level car accurately before opening doors.
3. THEN open doors.

Safety First

1. Don't open doors until car has stopped.
2. Don't open doors until car is level with floor.
3. Don't carry excessive loads of passengers or freight.
4. Don't allow unauthorized use or tampering.
5. Don't attempt to bypass any safety devices.
6. Do report any unusual operating condition, and don't operate elevator until it has been investigated.

The elevator car should be completely enclosed with metal, if possible, or at least the roof made of solid metal. Even small objects falling down a shaftway can strike with serious force. As an additional safeguard, it is well to cover all permanent openings in the walls of the car with heavy wire mesh. Falling objects often strike shaftway beams and are deflected in a horizontal direction. A solid steel car floor, well supported, is of great safety value, especially where heavy objects are transported in the elevator.

The importance, from a safety standpoint, of having a gate, or preferably a door, on the elevator car cannot be overemphasized, and it is essential that the gate or door be equipped with a switch connected into the elevator control circuit.

For safety to the occupants, and to mechanics working on the elevator, each car should be fitted with a telephone. This should be connected to a phone in the elevator machinery space, and if possible, also to the building phone system. This permits calm handling of emergencies, and insures against misunderstood signals. It is also wise to place a hand fire extin-

guisher of the carbon tetrachloride type in each elevator car as permanent equipment. Prompt action can often extinguish small fires such as sometimes can start in or around the elevator or in the shaftway.

Workmen assigned to elevator maintenance should be thoroughly coached in safety procedures. Whenever work is done on top of an elevator car or in a shaftway, a safety belt should be worn, and a strap or rope should connect the belt to some safe part of the car or shaftway, depending upon circumstances. Tools used in a shaftway should also be fastened with a strong cord or rope, to prevent their falling in the event they are dropped. A wrench or other heavy tool becomes a dangerous missile after it has fallen some distance. A safety hat is another must for workmen at any time they are in the shaftway.

Safety calls for double checks to be made whenever any mechanical or electrical work is to be performed on elevator equipment. Failure to exercise caution can have serious consequences. An instance is recalled where a mechanic was removing the brake shoe from the gearless hoist machine of an elevator that traveled 19 floors. For some reason, he failed to run the car to the top floor and place a block under the counterweight frame. He removed one brake shoe completely and then backed off tension on the other. Immediately the car began to ascend, propelled by the heavier descending counterweights. Fortunately, a helper seized a nearby timber and jammed it into the sheave wheel spokes, thus bringing the machine to a stop before it had gained a dangerous speed.

In another case, a mechanic was replacing the cover of a motor overload device on the control panel of a 50 horsepower elevator m.g. set. He thought the cover was non-metallic and hence did not open the line switch. The cover proved to be cast aluminum, however, and the flash resulting from his accidental short-circuiting of the terminals was sufficient to blow a 200 ampere unloaded line fuse, and to sear the side of his nose and burn off an eyelash.



This is one of eight plants to be built on The Southern Company system during 1951-54. New plants will provide an additional 1,000,000 kw of generating capacity.

Mississippi Power's Plant Sweat

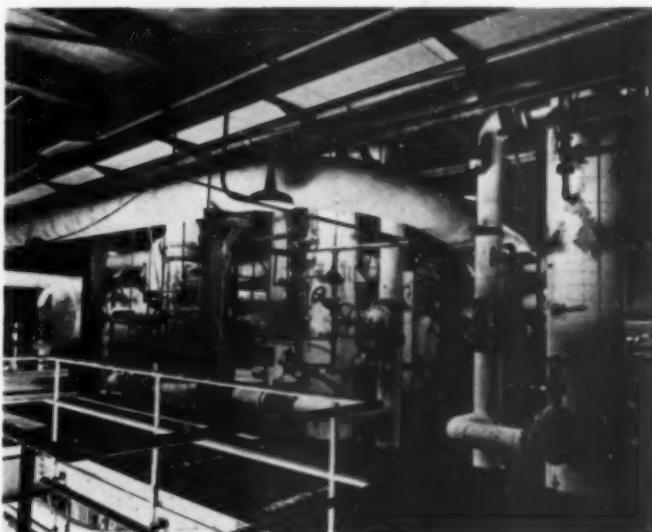
PLANT Sweat, like Mississippi Power Company's other modern installation, Plant Eaton, is a gas fired high pressure, steam electric generating plant. However, unlike Plant Eaton, it is built entirely above ground level. First major phase of construction was the driving of more than 700 ten-inch steel pipe pilings. Average depth of pilings is approximately 40

ft although some were driven as much as 75 ft.

These pilings support the base slab, which is 3 ft thick. More than 2,000 cu yd of concrete were required.

New unit, now under construction, will be a duplication of the one just completed. Plant Sweat generates at 13,800 v, stepped up to 110,000 v for transmission.

Interior view of Mississippi Power Company's Plant Sweat near Meridian, Mississippi. Second 58,000 hp unit is now under construction. Other major company projects include 90,000 hp additional capacity at Plant Eaton and a 107 mile 110,000 transmission line between the two plants by way of Newton.



NEW EQUIPMENT for Southern Industry

For more data circle Item code number on the postage free post card—p. 17

Miniature Indicators and Control Units

BAILEY METER COMPANY,
J-1 1050 Ivanhoe Rd., Cleveland
10, Ohio, have developed
miniature indicators and control units
under the trade name MINI-LINE,
which makes it practical to concen-

trate into a small space before a single operator all information and controls for operating one or more boilers, turbines, or process units such as cement mills, pulp and paper mills, chemical plants and refineries.

It is planned to mount MINI-LINE instruments on console type centralized control panels whenever possible.

These panels will be more than 50 per cent smaller than any previously available. Control from a centralized MINI-LINE control panel may be entirely automatic, or if operator wishes, individual units or the entire system may be controlled manually.

For more data circle Item code number
on the postage free post card—p. 17

Space savings are considerable with the new MINI-LINE control units of Bailey Meter. A new Multi-Point Indicator uses 87 per cent less space than its standard size counterpart. A Selector Valve uses 52 per cent less space, and a Remote Manual Relay uses 70 per cent less space.

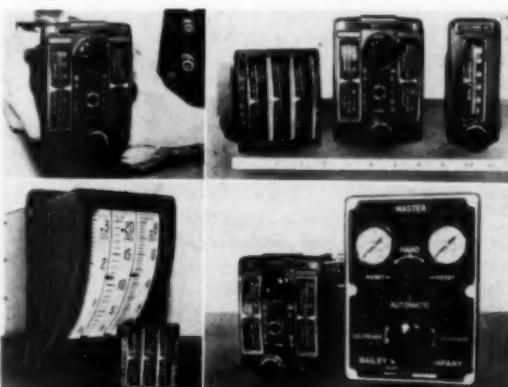
Top left—new Selector Valve providing instantaneous transfer between remote manual and automatic control. Transfer is made with top knob. Factor under control will not be disturbed by switching. Center knob used for remote set point adjustment and lower knob for remote manual control.

Top right—Here's the line-up of the new MINI-LINE equipment—Multi-Point Indicator, Selector Valve and Remote Manual Relay.

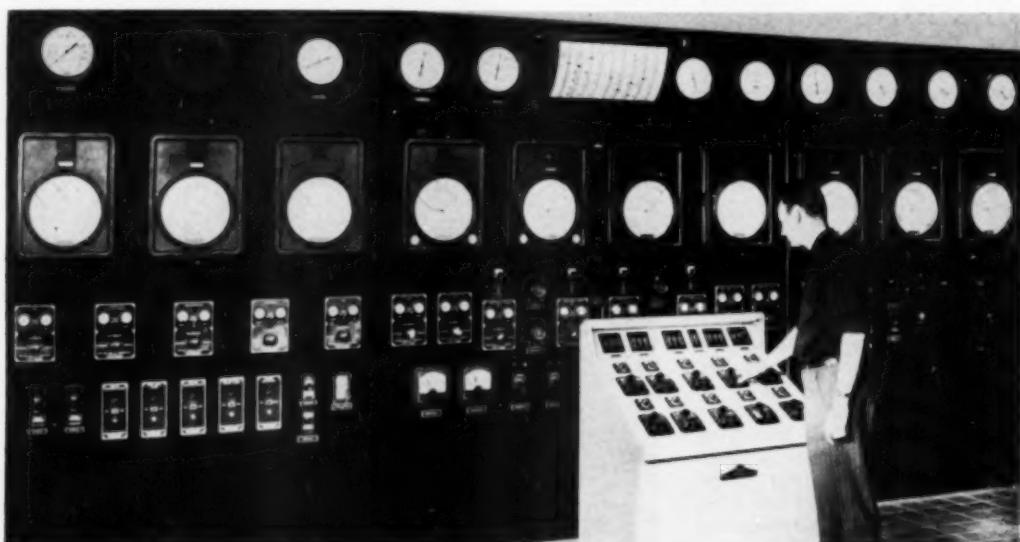
Bottom left—Standard size Multi-Pointer Gage behind a MINI-LINE Multi-Point Indicator.

Bottom right—Comparison of MINI-LINE Selector Valve with standard size selector valve.

Comparison of control panel utilizing instruments of conventional type versus a bench type panel utilizing the new miniature indicators. Vertical Panel is designed for use with boiler of approximately 250,000 lb/hr capacity and small bench board provides control for boiler of approximately 220,000 lb/hr capac-



ity. Approximately same number of measurements are indicated on each board and same number of electric and pneumatic control stations are provided. Large panel 6 ft, 6-in. high by approximately 15 ft long, whereas the bench panel is about 3 ft, 6-in. high by 2 ft, 6-in. long.



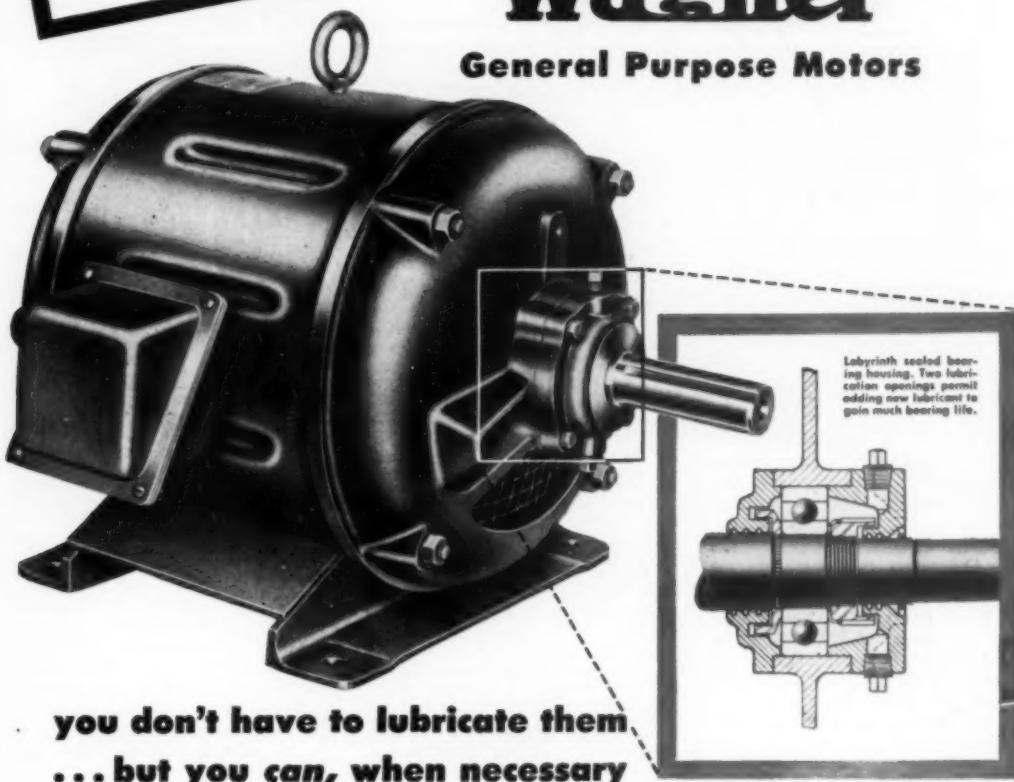


for longer useful motor life -

YOU CAN'T BEAT

Wagner

General Purpose Motors



you don't have to lubricate them

... but you can, when necessary

Wagner Steel-Frame Motors have been proved—durable, dependable and trouble-free by more than twenty years of hard usage in industry after industry. They have a reputation for long, useful life. Among the many engineering features that have built this reputation is the ample sized, sealed, bearing housing.

Wagner bearing housings are effectively sealed against the entrance of dirt or grit that cause rapid wear. You don't have to lubricate the bearings (motors in the smaller frame sizes will often operate

for the life of the unit without lubrication) but, Wagner Motors are provided with two lubrication openings—you can lubricate them, to add much useful motor life where the motors are used in tough applications.

Wagner's new Bulletin MU-131 gives full information on the proper lubrication of electric motors—write for your copy. Thirty-one branches, located in principal cities, are ready to assist you whenever you have a motor problem. Consult the nearest branch, or write us.



WAGNER ELECTRIC CORPORATION
6383 Plymouth Ave., St. Louis 14, Mo., U.S.A.

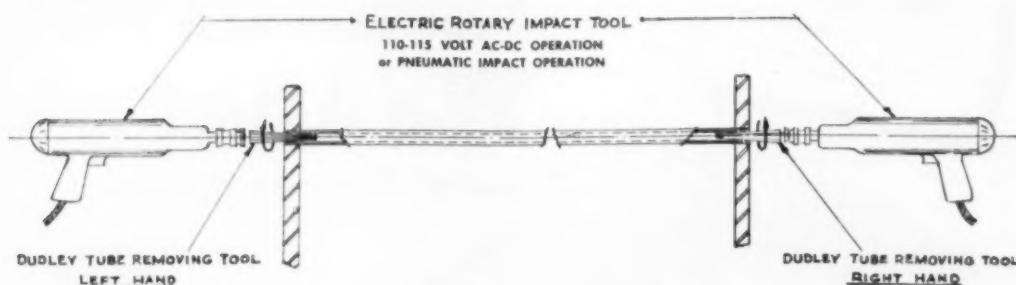
ELECTRIC MOTORS - TRANSFORMERS - INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS - AIR AND HYDRAULIC

BRANCHES IN 31 PRINCIPAL CITIES

588-9

new equipment (continued)

For more data circle Item code number
on the postage free post card—p. 17



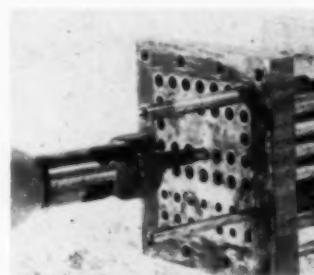
Tube De-Expanding Tool

J-2 FRANKLIN MANUFACTURING Co., 149 South Fourth St., Philadelphia 6, Penna., has announced a new de-expanding tool for rapid and easy removal of straight tubes. Manufacturer emphasizes that "pulling" tubes often results in longitudinal scoring of tube sheet hole, upsetting of ligament and hole enlargement.

With the new Dudley De-Expanding tool there is no cutting, drilling, or pulling. Two rotary impact tools either electric or air driven are used.

Any markings of sheet holes are of a radial nature, not longitudinal. One right hand tool is used and one left hand at the opposite ends of the tube to be removed; one tool impacting to the right, the other to the left at the same time. Thus tube is "torqued" until de-expanded. Flute design of the de-expanding tool causes tube

metal to flow into the flutes resulting in de-expansion.



Fork Truck Rotating Clamp

J-3 THE YALE & TOWNE MFG. Co., 11,000 Roosevelt Blvd., Philadelphia 15, Penna., has perfected a new hydraulically operated clamp for industrial fork trucks. Bales, bins, drums, etc., can be picked up and transported on the centerline of the truck.

Self-centering arms have inside opening range from 17-in. to 66-in. Clamp will handle loads up to 6,000 lb.

When used with a rotator, Yale & Towne clamp does not creep off center. Loss of pressure grip in arms minimized. Variable clamping pressure permits handling of any type load—fragile cartons, heavy containers, bales, boxes, etc.



Control Station

J-4 ALLEN - BRADLEY COMPANY, Milwaukee, Wis., is offering a new pendant push-button station, which is an oiltight control station. It is designed for use as a portable control or for suspension above a machine where it may be easily reached while the operator is near his work.

Pendant push button stations may be obtained in sizes having three units including the stop, to 10 units including the stop. Standard stop unit is a wobble stick in the bottom of the enclosure, but can also be furnished as a mushroom head mounted in the bottom or in the front of the enclosure.

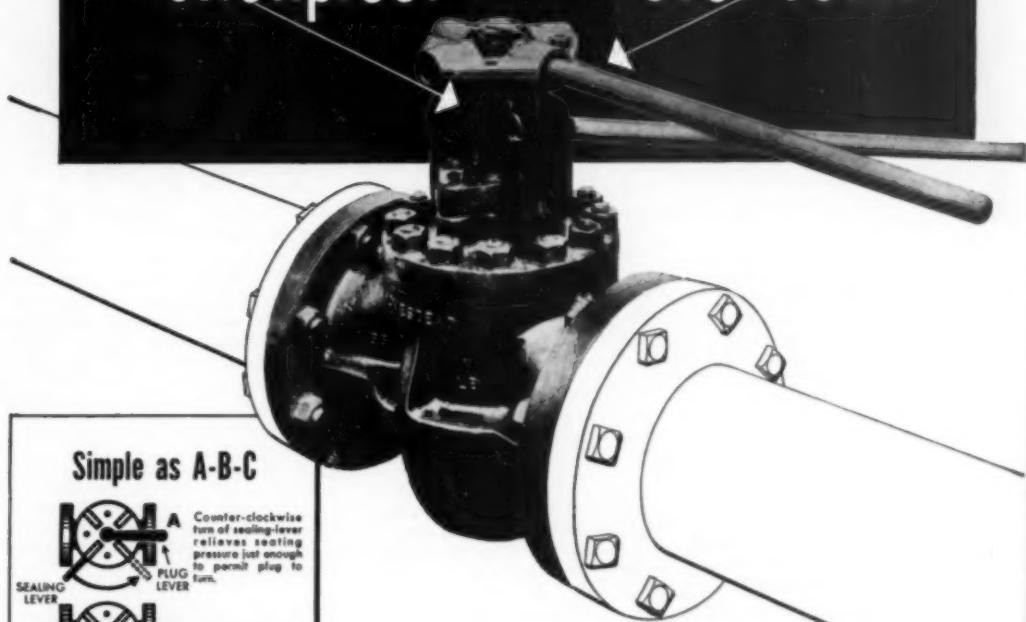
All enclosures used with the Bulletin 800T stations are equipped with oiltight control units. Each enclosure has a cable anchor at the top. Special pendant type control stations can also be built, the manufacturer states, with any combination of pilot lights, push button units, selector switch units, jogging units, or key-operated units.

For more data circle Item code number
on the postage free post card — p. 17

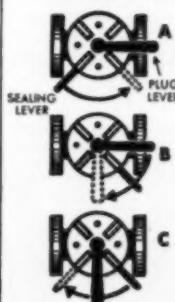
- at all times
- under all conditions
- throughout its long lifetime of service

This Homestead Valve will always work

it's **stickproof** because it's **lever-seald**



Simple as A-B-C



A Counter-clockwise turn of sealing-lever relieves seating pressure just enough to permit plug to turn.

B Plug lever turns plug to "open" or "closed" position.

C Clockwise turn of sealing-lever restores full seating pressure.

Homestead Lever-Seald Valves operate faster, 100—16 to 28 times faster than screw-stem type valves. They require no lubrication . . . provide unobstructed, straight-line fluid flow with minimum pressure drop . . . afford maximum protection to sealing surfaces against corrosive and erosive line fluids. And because only a quarter-turn is needed for full opening or closing, they are ideal for installation in restricted areas where operation of other types of valves might be difficult.

Next time you have damaged or sticking valves, replace them with Homestead Lever-Seald Plug Valves. Once you use them you'll never be satisfied with ordinary valves.

For complete information write for Valve Reference Book No. 39-3.

HOMESTEAD LEVER-SEALD PLUG VALVES

HOMESTEAD VALVE MANUFACTURING COMPANY

Serving since 1892

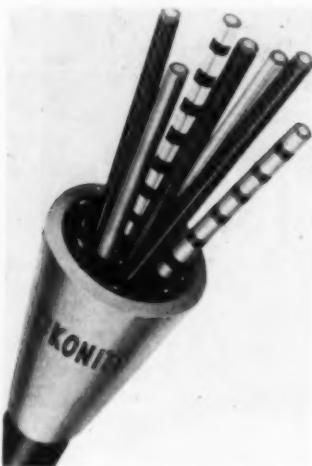
P.O. BOX 70

CORADPOLIS, PA.

new equipment (continued)

Cable Sheath Seal

THE OKONITE COMPANY,
J-5 Passaic, New Jersey, is offering an inexpensive moisture seal for terminating multi-conductor sheathed cables. Applicable to



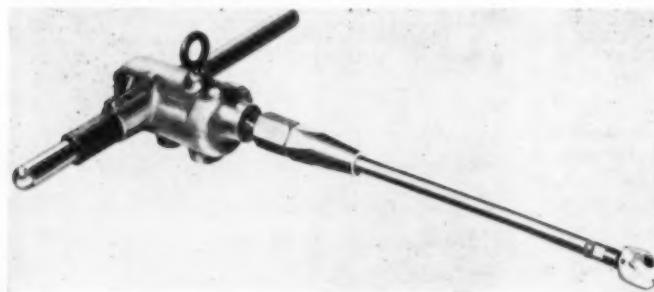
Okonite end seal eliminates the friction tape or makeshift windings. Cone-shaped to receive filling compound, device is easily and quickly slipped over cable.

cable diameters of from $\frac{1}{8}$ -in. to 2-in., the Okonite End Seal snugly fits over the cable sheath, preventing compound leakage. Compound hardens to form neat, permanent, moisture-proof

Heat Exchanger Tube Cleaner

THOMAS C. WILSON, INC.,
J-6 21-11 44th Avenue, Long Island City 1, N. Y. have made several improvements in their straight tube cleaner for process heat

Positive air driven, rotary shaft, drill type tube cleaner of Thomas C. Wilson scavenges the tube with air or water while cleaning. It operates on air pressure as low as 50 lb.



For more data circle item code number on the postage free post card—p. 17

seal and keeps conductors properly spaced.



Gate Valve

R-P&C VALVE DIVISION,
J-7 AMERICAN CHAIN & CABLE CO., INC., Reading, Pa., has

developed a forged steel gate valve for the high pressure field. Its features include a bolted bonnet to insure maximum service life and low maintenance cost, and tongue and groove joint with soft iron gasket to assure tightness. Stainless steel gland bolts and nuts prevent freezing or corrosion while the two piece gland and follower applies uniform pressure on packing.

The valve is available in sizes of $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2-in.

Rotating Roll Clamp

CLARK EQUIPMENT COMPANY, Battle Creek, Michigan, has a rotating roll clamp for attachment to fork trucks of 2000 lb capacity. Attachment has heretofore been available only for trucks of 3000 lb capacity and up.

exchangers. Weight—15 lb. Length—13-in. Capacity—from $\frac{1}{8}$ -in. up to $2\frac{1}{2}$ -in. or even 3-in. O.D. tubes. Hollow shafting is available in one piece up to 20 ft or in sectional threaded lengths. Minimum practical working headroom is 5 ft.

Unit can be rotated through 90 degrees, so that a roll may be picked up from horizontal position and stood on end, or vice versa. Rotated by cylinder with chain and sprocket linkage. Provided with positive stops at vertical and horizontal positions to eliminate excessive strains on the chain.



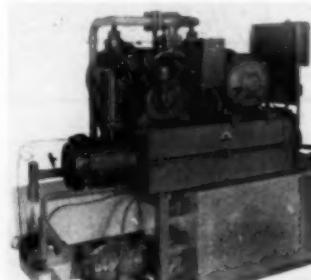
Clark Equipment's rotating roll clamp is now available for 2000 lb fork trucks. Clamp readily removable and can be used interchangeably with standard forks.

Water Cooling System

MAYER REFRIGERATING ENGINEERS, INC., Rutherford, New Jersey, announce their complete water cooling system called the CHIL-ER UNIT. It is a portable, compact, self-contained heavy duty refrigerating system including high head, high volume water circulating pump, storage tank and auxiliary equipment.

Temperature range is adjustable. Operates on gravity or pressure water return without additional pump. Automatically adjusts to variable load or flow. Suitable with brine for lower temperatures.

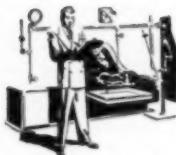
The Mayer refrigeration unit includes automatic starting switches, controls, piping and wiring. Unit is ready to be connected to power and water lines. Requires no foundation or bolting down.



BIRD-ARCHER'S COMPREHENSIVE 8 POINT WATER TREATMENT SERVICE

Even if your present water treatment methods appear satisfactory, it will pay you to look into Bird-Archer's 8-point water treatment service. Any or all of this comprehensive, efficient service is available to you. Talk to your Bird-Archer representative about it next time he calls. Or, write us now to arrange a consultation. No obligation, of course.

What Bird-Archer Does



1. Surveys Plant—Bird-Archer makes a complete study of plant operation involving the use of water or steam . . . checks present equipment and past performance.



2. Studies All Available Water—Starting at the source, Bird-Archer makes exhaustive analyses of water supplies.



3. Develops Treatment and Control Systems—On the basis of these comprehensive studies, Bird-Archer develops a complete system of treatment and control, including necessary operational changes.



4. Specifies Equipment that May Be Necessary—Bird-Archer determines whether installation of additional equipment will be helpful . . . analyzes benefits to be derived.



5. Furnishes Proper Chemical Treatments When Required—For more than a half century, Bird-Archer has manufactured specifically formulated treatments to solve individual problems.



6. Instructs Plant Staff—Plant personnel is carefully instructed by experienced technicians in the application of treatment and control . . . teaches simple, accurate test procedures.



7. Makes Periodic Check-Ups—To make certain that the recommended system is providing the best possible results, a Bird-Archer Service Engineer makes regular, personal check-ups.



8. Offers a Laboratory Service for Scientific Analysis—Modern Bird-Archer laboratories, staffed by trained chemists, specialize in water analyses and research...check accuracy of plant control.

BIRD-ARCHER WATER TREATMENT



THE BIRD-ARCHER COMPANY, 4337 NORTH AMERICAN ST., PHILADELPHIA 40, PA.
NEW YORK • CHICAGO

IN CANADA: The Bird-Archer Co., Limited, 503 McGill Building, Montreal

IN MEXICO: Calderas y Accesorios, S. A., Amsterdam 291, Mexico, D. F.

R & M dust-tight construction spells low maintenance...



for BAY STATE Abrasive Products Co.

of Westboro, Mass., who put five Robbins & Myers "J" hoists in service last June handling grinding wheels through manufacturing operations. Airborne abrasive dust that has kept maintenance costs high on other handling equipment has not been a serious problem for their "J" hoists. The "J" hoist motor, load brake, and control pendant are tightly enclosed; dust and trouble stay out; and "J" hoists stay on the job!

When you have a handling problem involving vertical or lateral travel, or both, and you want to do the job in the most efficient manner, you cannot afford to ignore the sound economics of handling through the air. And for sound practical advice on your specific material handling problems, call in your nearest Robbins & Myers representative. He has the experience to make the R & M equipment you purchase pay a high return on your investment. Write for bulletin No. S81P.

TAKE IT UP WITH



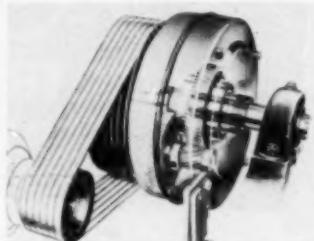
MOTORS HOISTS CRANES
FANS MOYNO PUMPS

new equipment (continued)

For more data circle item code number
on the postage free post card—p. 17

Overload Release

THE AMERICAN PULLEY CO., J-10 4200 Wissahickon Ave., Philadelphia 29, Pa., has announced the availability of a simple mechanical overload release for



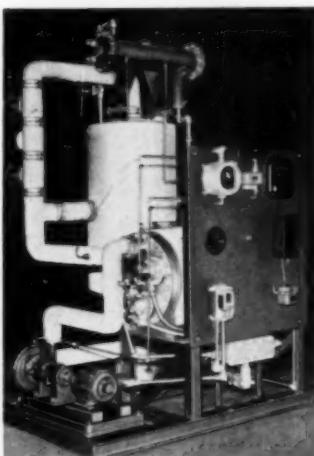
use with the complete range of sizes of the company's reduction drive.

This overload release is used on the reducer end of the torque arm and is so constructed as to engage the housing stud of the unit. The overload release mechanism is pre-set for the maximum torque of each of the seven sizes. The release provides instantaneous release of the unit upon any excessive jamming or shock loads.

Heat Transfer Units

STRUTHERS WELLS CORPORATION, Warren, Pa., has developed a new standard line of heat transfer units supplied complete with instruments, piping, insulation and other accessories, ready for immediate use upon delivery.

With capacities ranging from 100,000 to 500,000 Btu per hour, these heaters have a temperature range to



**This 'dust' man can be
your best friend**

*If you ask him about
the Most Efficient, Most
Economical Method of
collecting Nuisance Dust*

Wherever objectionable dust goes uncontrollable, you aggravate employee morale; you impair plant-community relations.

In either case, a Buell "dust" man can probably help. That's his job, and he is backed by more than 200 man-years of experience in solving industrial Nuisance Dust problems. We think you'll agree, too, that Buell's knowledge of dust is the reason why so many Utility and plant operators include us among their best business friends.

If you have questions regarding the latest advance in nuisance-dust Collection Equipment—its design, construction, and operating characteristics, a letter today will bring a quick reply. And—ask for the new, self-indexed Buell Dust Collection bulletin. Buell Engineering Company, Dept. 80-H, 70 Pine Street, New York 5, N. Y.

Buell van Tongeren
Cyclone in series with
Electric Precipitator
provides high efficiency
collection of
Fly Ash at a large
Eastern Utility.



buell®



HIGH-EFFICIENCY CYCLONES
'L' PRECIPITATORS
LOW DRAFT LOSS COLLECTORS
SPECIAL PURPOSE COLLECTORS
DUST HOPPER VALVES

ENGINEERED EFFICIENCY IN DUST COLLECTION

new equipment (continued)

about 750 F, using "Dowtherm" as a liquid or vapor medium. Other heat transfer fluids may also be used in this equipment.

The entire unit may be base mounted at the factory or supplied with all essential equipment for mounting. A special heating element, designed to eliminate thermal breakdown or coking troubles, is included in the units.

Engine Water Coolers

J-12 YOUNG RADIATOR COMPANY, Racine, Wis., has announced an improved line of engine jacket water coolers which are said to be more compact and more rugged than previous models.

The new line of welded steel units are constructed so that gas and/or lube oil cooling coils may be mounted between the fan and liquid cooling core. The blower type fan cools the coils first, with a minimum rise in air temperature, little affecting the cooling properties of the air flow over the liquid cooling core. This core arrangement makes possible a lower fan horsepower requirement than more conventional arrangements.

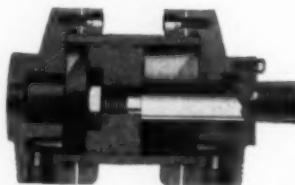
Other design features are vertical

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water flow, heavy formed steel channel side members, steel side supports for cores, and press-formed heavy weight non-ferrous headers.

Hydraulic Cylinders

J-13 RIVETT LATHE & GRINDER, INC., Brighton 35, Boston, Mass., is offering a new hydraulic cylinder whose covers may be rotated for any pipe connection and installation made in a minimum of space. The keeper ring design is used to permit rotation of covers.



External "O" rings are used as static seals, to provide for leak-proof

operation. Sealing efficiency improves with increased pressure. Other construction features include self-adjusting composition rod packing, bronze rod guide, ground and polished alloy piston rod, seamless drawn steel tubing, and large pipe connections.

Refractory Coating

J-14 POWER CHEMICALS DIVISION, E. F. DREW & CO., INC., 15 East 26th St., New York 10, N. Y., has announced the development of a new type of refractory coating. When dry, the coating practically becomes an integral part of the brick, and will expand and contract uniformly with the brick under various heat conditions.

According to the manufacturer, the coating will prevent slagging, spalling, abrasion and disintegration of firebricks caused by combustion chemicals and high temperatures. Boilers may be fired immediately after application.

A-C Part Winding Starter

J-15 ALLEN-BRADLEY COMPANY, Milwaukee, Wisconsin, announces a new a-c part winding starter for use with motors which employ two separate parallel windings, star or delta, to obtain increment starting.

Pressing "start" button closes first starter which energizes one of two parallel windings. Meanwhile, timer is in operation and after few seconds energizes second starter. With both starters closed, full line current is supplied to motor through both windings, each using 50 per cent of total current drawn.

SAVES LABOR
Stops Losses
Caused by OVER-heating

POWERS No. 11 Temperature INDICATING REGULATORS
—need no compressed air or electricity for their operation

SIMPLIFY your temperature control problems with Powers No. 11 Regulators. They're easy to install. Use them wherever you want a rugged, self-operating control to maintain a constant temperature. Better Temperature Control—and extra years of dependable service are assured by: 1) Easy to read 4" dial thermometer shows temperature of liquid or air being controlled, makes it easy to adjust regulator for proper temperature. 2) Has valve stem lubricator. 3) OVER-heat protection. 4) Temperature adjustment has OILITE thrust bearing. Available also without dial thermometer in a variety of 60° F. ranges and valve bodies $\frac{1}{4}$ " thru 8".

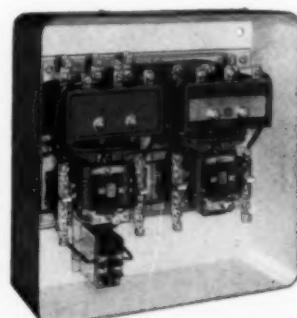
► WRITE FOR BULLETIN 329 • THE POWERS REGULATOR CO. • 2750 Greenview Ave. Chicago 14, Ill. • Offices in over 50 Cities (11P)

CONTROLS
TEMPERATURE of LIQUIDS or AIR
Simple • Economical • Dependable

SELF ACTING

POWERS

ATLANTA, GA., 142 Spring St., N. W.





Walworth manufactures a complete line of Gate, Globe, Angle, Check, and Lubricated Plug Valves, made of Stainless Steel, Steel, Iron, Bronze, and Special Alloys in a wide range of sizes and temperature-pressure ratings.

Fittings of steel, iron, and bronze are also manufactured in all conventional types and sizes.

WALWORTH valves and fittings

60 East 42nd Street, New York 17, N. Y.

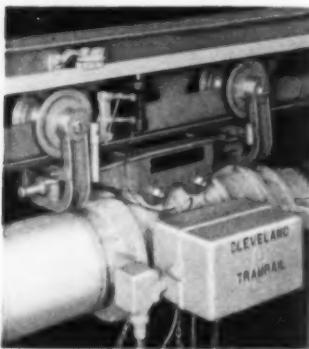
Distributors in principal centers
throughout the world

new equipment (continued)

Safety Electrification for Cranes and Tramrail Systems

J-16 THE CLEVELAND TRAMRAIL DIV., CLEVELAND CRANE & ENGINEERING CO., Wickliffe, Ohio, announce new type of electrification for overhead cranes and tramrail systems especially designed to provide maximum safety.

Safety improvement, known as Saf-Powr-Bar, consists of inverted U-shaped conductor bars inside of which



For more data circle item code number on the postage free post card—p. 17

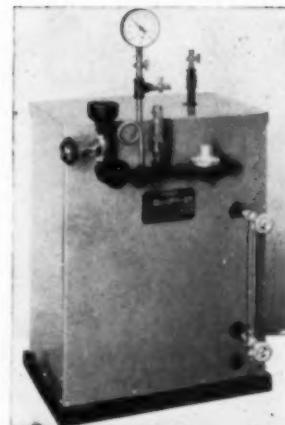
operate sliding current collector shoes. Device prevents accidental contact with an electrified conductor bar.

Sliding current collector shoes contact three sides of the bar and operate on a pantographic principle. Diagonal spring provides upward pressure on graphitar shoe while torsion spring within a plastic housing causes pressure to be applied on both sides of conductor bar.

Saf-Powr-Bar can be applied to all new Cleveland Tramrail systems as well as replacement on open-bar electrification. May also be installed in many hand-propelled systems where motor-powered hoists, carriers or cranes are now desirable.

Electric Steam Generator

J-17 LIVINGSTONE ENGINEERING COMPANY, 100 Grove St., Worcester 5, Mass., have expanded their Series 1½ hp line to make Speedelectric Boilers available from 15 psi to 250 psi. Additions are a Model LP (Maximum pressure 15 psi) and a Model 400 maximum pressure 50 psi). Available for 220, 440

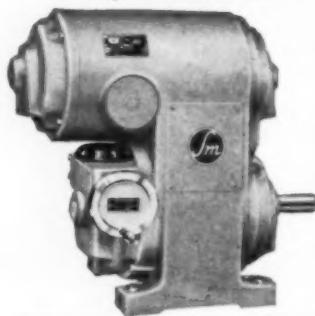


No coils, tubes, open flame and no low water danger in this Speedelectric boiler of Livingstone Engineering. Heat generated by resistance of boiler water to flow of current between electrodes. If there is no water in boiler, no current flows and power input stops.

or 550 v single phase power, these new boilers are compact and require 15 kw power input for maximum steam output.

power modernization

Even a brand new motor
may be obsolete ...



Ask for your copy of pictorial bulletin No. A7a showing Sterling Electric Power Drives Turning The Wheels of Industry.



STERLING SPEED-TROL

... Gives You Variable Speed Control Necessary For:

- **PROCESS CONTROL OF:** Temperature—viscosity—level—pressure—flow—etc.
- **TIME CONTROL OF:** Baking—drying—heating—cooking—pasteurizing—soaking—chemical action—etc.
- **EQUIPMENT ADAPTATION TO:** Load variation—sequence synchronization. Size—tension—hardness or shape of materials to be processed—machined—conveyed—blended—mixed—etc.
- **VARIATIONS IN:** Quality—quantity—operators' abilities—etc.

STERLING ELECTRIC MOTORS

Plants: New York 51, N. Y.; Los Angeles 22, California; Hamilton, Canada; Santiago, Chile.
Offices and distributors in all principal cities.

Fractional Horsepower Starter

J-18 THE SQUARE D COMPANY, 4041 N. Richards St., Milwaukee 12, Wis., has developed a new fractional horsepower manual starter designed to control and protect single phase a-c and d-c motors of 1 hp and less. Both single and double-pole devices are available. The double-break contact mechanism has quick make and break action and con-



tact tips are of silver. Interchangeable overload relay units are accessible from the front. Line and load terminals are arranged for straight-through wiring.

Types of enclosures available, in addition to the open type starter, are general purpose, water and dust tight, and explosion-resistant. A standard switch box and flush plate can be used with the open type switch unit.

Speed Reducer

WESTINGHOUSE ELECTRIC CORP., Box 2099, Pittsburgh, Pa., is producing new type double-reduction speed reducers, in ratings from 1 to 100 hp. They are designed for applications on small to medium size drives where the prime mover is coupled or belted to the gear unit.

These double-reduction speed reducers use all external type helical gearing, arranged in a horizontal plane. When coupled to an electric motor, a straight line drive results. Eight unit sizes are available; twelve standard gear ratios range from 6.25 to 58.3:1.

Other features include: accurately hobbed single-helical gearing, taper hardened; split-construction cast iron case for accessibility; positive splash lubrication system; antifriction bearings.

Magnet Chain

AMERICAN CHAIN DIVISION, J-20 AMERICAN CHAIN & CABLE COMPANY, INC., York, Pa., has announced two new types of Ox Bow Magnet Chains, designed for handling materials with electro-magnets.



Both the 1-in. and 1½-in. chains are made in their entirety from alloy steel and heat treated to 125,000 psi tensile strength.

Bearing surface is provided by the alloy yoke which has a welded holding stud, positioned so as to prevent ex-

Your Maintenance Costs

Will Be Lower With

DART



This True Ball Joint Makes the Difference

Once a Dart Union is in place you can forget it. You'll have a drop-tight joint that stays tight — that never requires re-tightening and extra maintenance.

Why? Primarily because Darts are made with extra care. Seats, for instance, are both of a special bronze alloy — highly resistant to corrosion and pitting. And they're accurately machined then spherically ground to ensure wide, true-bearing joint surfaces. Finally, high-test, air-refined, practically indestructible malleable iron is used so body and nut can shrug off the toughest abuse in installation or use.

Try Darts! — you'll find the longer, better service means true economy.

DART UNION COMPANY

Providence 5, Rhode Island

The Fairbanks Co. — Distributors
Boston New York Pittsburgh



JEFFERSON

300 LB. Trouble Free Unions for Tough Jobs

JEFFERSON Unions are made of Air Furnace Malleable Iron of an average tensile strength of 55,000 p.s.i., with a yield point of 36,000 pounds and an elongation of 15% in two inches.

Our seat rings are cut from seamless drawn brass tubing, free from all casting defects—sound and uniform always.

They are accurately tapped at all times; are carefully air tested and inspected before shipment, and each and every one approved only if they meet our rigid standards of inspection.

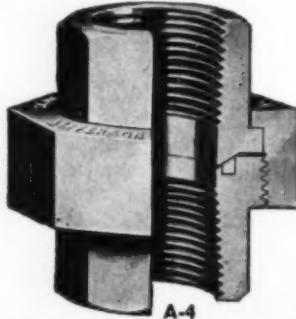
Slightly Higher Priced
But more than worth it.

See these outstanding features—

- ★ A ground ball joint to give leak-proof service
- ★ Octagonal with square corners fits any type of wrench
- ★ No gasket required, hence no maintenance problem
- ★ Hot-dip galvanized to Government Standard for corrosion resistance

Made in all thread sizes from $\frac{1}{4}$ " to 4" American Standard Taper Threads.

Also manufacture Excel 250 lbs and Master 150 lbs. All unions can be furnished with all-iron seats.



JEFFERSON UNION CO.

650 WEST 26th ST., NEW YORK 1.
79 GOODING ST., LOCKPORT, N.Y.
45 FLETCHER Ave., LEXINGTON, MASS.

new equipment (continued)

Free additional information is available to readers of Southern Power & Industry. Check item number on the postage free service coupon post card—page 17.

cessive movement, reducing peening and battering of connections. Also provided is a zerk or Alemite flush fitting for lubrication of the Ox Bow which reduces friction.

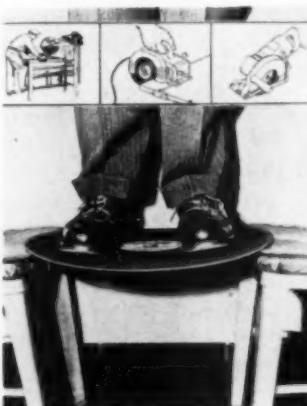
The reach of the device can be increased in multiples of two links or $5\frac{1}{2}$ in. on the 1-in. chain and two links or $6\frac{1}{2}$ in. on the $1\frac{1}{4}$ -in. chain.

Masonry Cutting Blade*

CLIPPER MANUFACTURING COMPANY, 2800 Warwick, Kansas City 8, Mo., announce a new break-resistant masonry cutting blade. The Clipper B-R blade is manufactured in layers of glass fiber cloth impregnated with resins and Silicon Carbide.

Its most effective performance is in the softer range of materials such as limestone, sandstone, light aggregate concrete products, etc.

Clipper break-resistant blade gives outstanding efficiency on small hand-powered tools where it is impossible to maintain true cutting level. This causes blade to bend or twist in the cut resulting in breakage with the ordinary abrasive blade.



Valve Actuators

LEDEEN MANUFACTURING Co., 1602 S. San Pedro St., Los Angeles 15, Calif., has introduced a line of valve actuators designed for the operation of gate

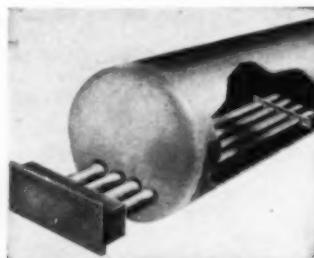
valves, plug valves, dampers, diaphragm valves, butterfly valves and sluice gates.

The actuators are basically cylinders, equipped with brackets, valves, controls, and couplings to make them suitable for almost any type of operation required. They can be adapted to any make, size, and type of valve; to operate against any line pressure; to work on any fluid medium, and with any pressure available. They can be arranged for on-and-off service, or for positioning service.

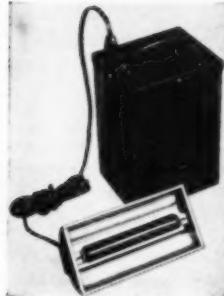
Tubular Heaters

HYNES DIVISION of the MARTIN-QUAID Co., 1878 Sedgley Ave., Philadelphia 32, Pa., has announced a complete line of tubular heaters that provide low density electric heat for oils, tars, resins and other viscous fluids.

According to the manufacturer, the design of the new heaters permits large input capacity without exceeding critical heat density limitations of the fluid being heated.



By using various combinations of tube and element assemblies, the tubular heaters can be provided to fulfill most requirements, as to total input capacity, heat density, and conforming to the physical requirements of the tank or vessel. These heaters are installed without liquid joints and the internal heating elements can be removed from the tube enclosures at any time without draining fluid from the vessel. Because of their construction, the heaters are said to be practically immune to mechanical damage. They are available in moisture or explosion-proof models.

**Blacklight Leak Detector**

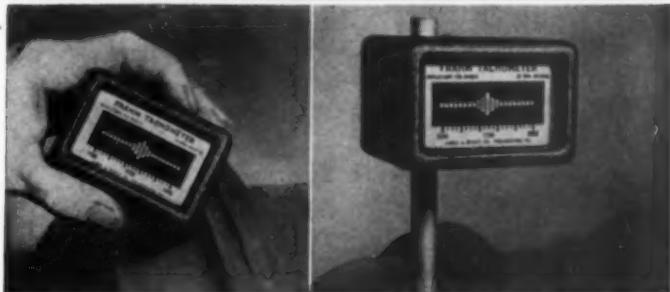
J-24 GEORGE M. GATES & Co., INC., Hempstead Turnpike & Lucille Ave., Franklin Sq., L. I., N. Y., announce their Raymaster Model TFS4-B30 Blacklight Exploring Lamp for the detection of leaks of liquids in vessels of all kinds.

Dilute solution of fluorescing agent placed inside container or vessel. Slightest flow through wall is signalled by a bright glow under influence of the rays from the lamp.

Stacker for Narrow Aisles

J-25 THE AUTOMATIC TRANSPORTATION COMPANY, 149 West 87th St., Chicago, Ill., has developed a lift mechanism that retracts after engaging a pallet, making possible use of a driver-led electric industrial truck in aisles six feet wide. Capacity of the unit is 1,500 lb for a 32-in. load.

Here's how the battery-powered Automatic stacker works—operator moves stacker into desired position for picking up load. He raises fork to proper height, then presses a button which moves forks toward load and into pallet. He then raises load a few inches, pushes another button, and the entire upright section is retracted.

**BIDDLE***Instrument News***MEASURE SPEED BY RESONANCE
FRAHM® RESONANT REED TACHOMETERS**

The Miniature Frahm instruments shown above weigh about 12 ounces and measure approximately 3" x 2" x 2 $\frac{1}{4}$ ". Various speed ranges are available from 1000-1500 to 9000-13,000.

The phenomenon of resonance activates the delicately tuned reeds when touched to any part of a rotating machine or when permanently mounted. 60° or 90° brackets are furnished where mounting is desired. In confined spaces, the convenience of merely touching the instrument to

any part of the machine casing is highly desirable and a considerable safety factor.

Since there are no movable parts in Frahm Resonant Reed Tachometers there is nothing to require maintenance. They are built to take rugged handling.

Frahm Tachometers are made in a variety of shapes and sizes with splash-proof cases and reeds tuned to guaranteed accuracy within 0.5%.

Write for Bulletin 31-SP.

**WIDE RANGE PRECISION HAND TACHOMETER
THE DR. HORN TACHOMETER**

We are now prepared to make immediate delivery of this instrument, considered by many to be the ultimate in a fine speed measuring device. Pointer affords instantaneous reading of rpm of rotating shafts, or linear and peripheral speeds, regardless of direction of rotation. Measures in six ranges from 25 rpm to 30,000 rpm. Protected against overspeeding damage. Operates equally well in a vertical, horizontal, or slanting position. Simple mechanism. Low maintenance. Long life.

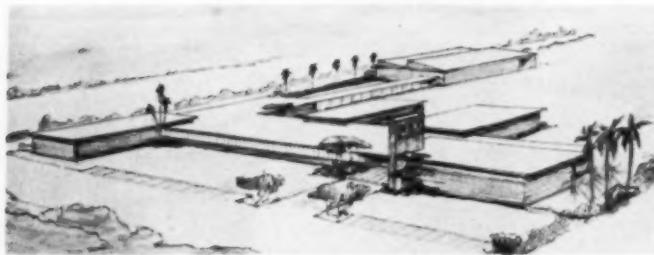
James G. Biddle Co. is the sole distributor and authorized service agency for these highly regarded instruments.

Write for Bulletin 35-65-SP.

**JAMES G. BIDDLE CO., 1316 ARCH ST.
PHILADELPHIA 7, PA.**

ELECTRICAL TESTING • SPEED MEASURING INSTRUMENTS • LABORATORY & SCIENTIFIC EQUIPMENT

NEWS for the South and Southwest



Infilco's New Tucson,
Arizona Headquarters

Having moved executive, engineering and sales offices from Chicago to Tucson, Arizona, last September, INFILCO INCORPORATED, leading makers of water conditioning and waste and sewage treatment equipment, have started construction of a new headquarters building.

The new building will occupy 7½ acres, comprise 36,000 sq ft floor

space, house over 200 employees and cost more than \$400,000.

When the new building is completed, the chemical laboratories will be brought out from Chicago to join the other divisions and will occupy its own specially designed laboratory. Manufacturing and certain phases of engineering will remain in the Chicago Plant at 325 West 25th Place, the location which Infilco has occupied for over fifty years. With the additional facilities provided by its new research

and development center, Infilco, Inc. plans to continue the expansion of its operations in the water conditioning, sewage disposal and waste treatment fields.

Pulp and Paper Conference Savannah, Ga.—October 15-18th

The Engineering Division of the TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY will hold its 6th Annual Conference at the General Oglethorpe Hotel in SAVANNAH, GEORGIA, on October 15-18, 1951. Included in the extensive program are the following:

Monday, October 15th—Engineering Research and Machine Design Session, with papers on "A Study of the Calender," and "Capacity of Thickeners." The Mill Design and Economic Aspects Session will include "Pump Difficulties in Pulp and Paper Mills" and "Mill Engineer's Selection of the Paper Machine Drive." Also scheduled is "Report on Centralized Control of Stock Systems."

Tuesday, October 16th—The Hydraulics Session will include "A Shear Anterior for the Correlation of Hydraulic Behavior of Paper Stock in Pumps, Pipes, Valves and Flow Meters," "Interim Report on Pipe Friction Studies at the University of Maine," and "The Distribution of Velocity Gradients of Paper Stock in Pipes."

The Steam and Power Session will feature "Materials and Design of Piping Systems for High Pressure and High Temperature Service," "Gas Turbine Applications in the Paper Mill," "The Power Requirements of Fourdrinier Sections," and "Application of Cables in Pulp and Paper Mills."

Discussion Sessions will feature "Preliminary Report on Power Requirements for Press Sections of Paper Machines," "Cinder Collection," and "Education of Power Plant Engineers."

Wednesday, October 17th—Drying and Ventilating Session with papers on "High Pressure Driers," and "Ventilation for Comfort of Personnel." The Materials Handling Session will feature "The Handling of Pulpwood in the Mill Yards."

The Mill Maintenance and Materials Session will have "Use and Maintenance of Steel Sash in Pulp and Paper

Don't let your subscription lapse . . . October will be a BIG issue

Better Production In Southern and Southwestern Plants

The 1951 BETTER PRODUCTION ISSUE of S.P.I. will present specific information showing how better performance is being obtained through improvements in:

Buildings & Equipment

Power & Steam Generation

Piping & Valve Systems

Electrical Systems & Control

Power Transmission & Utilization

Lubrication & Maintenance

Materials Handling

Industrial Water Systems

Air Conditioning, Heating & Ventilation

Lighting & Other Facilities

Instruments & Controls

Production Equipment

Manpower Utilization

Other Functions of Broad Interest

CASE STUDIES will show exactly how production has been improved in specific Southern and Southwestern Plants. While emphasis will be placed on increased production, related improvements such as equipment modernization, better maintenance, fewer rejects, reduced operating costs, etc., will be included as part of the overall BETTER PRODUCTION THEME.

THE OBJECT of the entire issue will be to present a large number of proven procedures and improvements that may be copied and put to work toward increasing output and improving performance of Southern and Southwestern plants.

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FUTURE EVENTS Of Engineering Interest

NATIONAL ASSOCIATION OF POWER ENGINEERS, INC., A. F. Thompson, Dir. of Exhibits, Suite 1060, 176 West Adams St., Chicago 2, Ill.
Aug. 21-23, Golden Anniversary National Power Show, Hotel Plaza, San Antonio, Texas.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, C. E. Davies, Sec'y, 29 West 39th St., New York, N. Y.
Sept. 10-14, Industrial Instruments and Regulators Division and Instrument Section, Annual Exhibit and Joint Conference, Houston, Texas.
Sept. 24-26, Petroleum Mechanical Engineering Conference, Hotel Mayo, Tulsa, Okla.
Oct. 11-12, Fuel and AIME Coal Divisions Joint Conference, Hotel Roanoke, Roanoke, Va.
Nov. 25-26, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, R. G. Macdonald, Sec'y, 122 East 42nd St., New York, N. Y.
Oct. 15-18, Engineering Division, 4th Annual Conference, General Oglethorpe Hotel, Savannah, Ga.

Mills," and "Electrical Maintenance, Including Electronic Equipment."

The program for Thursday, October 18th will include visits to the Union Bag & Paper Corp., Savannah, Georgia, and the Southern Paperboard Corporation at Port Wentworth, Georgia.

For additional information on this extensive engineering conference write R. G. Macdonald, Secretary-Treasurer, Technical Association of the Pulp and Paper Industry, 122 East 42nd St., New York 17, N. Y.

Research Institute—San Antonio

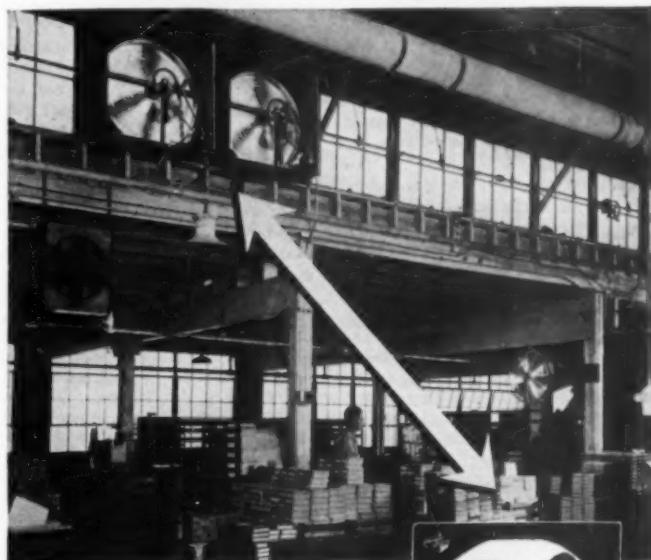
Appointment of JAMES V. McGOODWIN, as director of the INSTITUTE OF INVENTIVE RESEARCH, SAN ANTONIO, TEXAS, was announced recently by DR. HAROLD VAGTBORG, institute president.

SASI—Birmingham Conference

THE SOUTHERN ASSOCIATION OF SCIENCE AND INDUSTRY, ATLANTA, GA., reported the most successful year in its ten-year history at its recent conference held in BIRMINGHAM, ALA. In a report to the SASI Board of Trustees, President Paul W. Chapman cited a series of significant achievements, including: publication of the first annual directory of Southern research facilities, survey of industrial opportunities in technical fields, start of a survey of Southern manufacturing, launching of a program to encourage top-ranking science graduates of Southern colleges to stay in the South, introduction of a new Press Award for outstanding journalistic work in the science-industry field, and a general expansion of the Association's development program.

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Pays Dividends

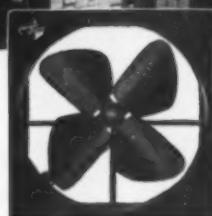


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"Active air" is air in motion . . . clean, fresh, invigorating air that pays dividends in greater employee efficiency and morale, improved public relations, too. The installation of Emerson-Electric Exhaust Fans puts "active air" in your buildings, provides dependable, economical ventilation the year around.

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Belt-Drive Exhaust Fans
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Quiet, efficient, heavy duty models in blade sizes from 12" to 30". Overlapping blades, ball-bearing or sleeve-bearing motors.

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Allis-Chalmers Opens New Atlanta Branch Building

The ALLIS-CHALMERS MANUFACTURING COMPANY have opened their new factory branch house at 4646 Peachtree Boulevard, ATLANTA, GEORGIA. More than 350 dealers, territory salesmen and company executives viewed the streamlined facilities on June 21.

New building is designed for the use of fork lift trucks and a conveyor system speeds the packaging of repair parts. The modern, one-story structure has 60,000 sq ft of floor space, plus 8,000 sq ft of docks for trucks and rail shipments.

The factory branch was established in Atlanta in 1935 and continued expansion of the industrial equipment sales made the new building necessary. It will serve as power machinery distribution center for industrial dealers in South Carolina, Georgia,

Alabama and Florida. It will distribute machinery from five Allis-Chalmers factories, including the one at Gadsden, Alabama.

Company executives who attended the opening included: R. S. STEVENSON, vice-president in charge of the tractor division; W. G. SCHOLL, general sales manager; C. N. KARR, sales promotion manager; CARL M. MEYER, manager of buildings and properties; V. M. HOLLOWAY, assistant industrial sales manager; FRANK MUSSELL, eastern territory sales manager; J. M. HAILE, eastern industrial manager; HAROLD M. SCHUDT, general manager of Gadsden Works; G. M. MALMO, manager of Memphis branch; J. L. MENDELL, manager of Charlotte branch; E. S. KEHR, southeast regional sales manager for general machinery; and CHARLES F. O'RIORDAN, manager of Atlanta office of general machinery division.

E. H. POLZIN is manager of the Atlanta branch organization; E. A. CONWELL, assistant manager; FRANK YOUNG, agricultural sales manager; and CLAUDE M. EVITT, industrial sales manager.

Boardman Vice President Thermatomic Carbon

CLARK C. BOARDMAN has been appointed a Vice President of the THERMATIC CARBON COMPANY. Mr. Boardman was formerly manager of the company's STERLINGTON, LA., plant. ROBERT W. CRETNEY, who was previously Plant Superintendent, has been named Plant Manager to replace Mr. Boardman. Thermatomic Carbon Company, which is an affiliate of Commercial Solvents Corporation, is a producer of special types of carbon blacks.

Leeds & Northrup New Houston Office

The Houston office of LEEDS & NORTHRUP COMPANY, Philadelphia manufacturers of electrical measuring instruments, automatic controls, and heat-treating furnaces, has been moved to 2480 Times Boulevard, HOUSTON 5, TEXAS, from its former location on Texas Avenue. This new office provides 50 per cent more space, and affords correspondingly better facilities for supplying engineering information and service to manufacturers, researchers, and educational institutions in the area from New Orleans to the California line.

Dowell Appoints Walther

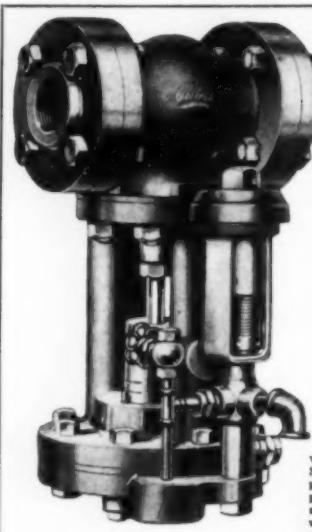
HERB WALTER, JR., Development Engineer for DOWELL INCORPORATED in TULSA, has been placed in charge of the sales of cathodic protection products for retarding electrolytic corrosion of pipe lines and industrial equipment.

The new head of the Cathodic Protection Department was formerly working with the Industrial Division in RICHMOND, VIRGINIA. He will continue working in some phases of the Industrial Division.

Rubber Plant in Operation—W. Va.

Reopening of the world's largest rubber plant—the giant government-owned facility at INSTITUTE, W. VA.—has been completed, W. S. RICHARDSON, president of B. F. GOODRICH CHEMICAL COMPANY, announced recently.

Richardson revealed that all production lines at Institute are now operating slightly above their rated capacity of 90,000 long tons of rubber



Pressure Reductions From 600 Lbs. to Ounces

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EXHAUST Broad, one-step reduction with a single-seated valve is an important investment economy you make when you buy SQUIRES Vertical Reducing Valves. Most important to you, however, is the steady, dependable pressure control you get with SQUIRES. It maintains a positive, constant reduced pressure within ounces—whether operated by steam, air or water. It is a positive dead-end, single-seated valve.

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Before deciding, get all the facts for yourself about SQUIRES Vertical Reducing Valves. Write today and ask for Bulletin Z-103.



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annually. He said that rubber is made at Institute in three production lines, each with a rated capacity of 30,000 long tons. Institute had been in standby condition since 1947.

Georgia Power Received Award

For its encouragement of community improvement through its Community Development Program, the GEORGIA POWER COMPANY, ATLANTA, GA., was awarded the Charles A. Coffin Medal at the 19th Annual Convention of the EDISON ELECTRIC INSTITUTE in Denver, Colo. The Coffin Award is the highest honor than can be bestowed on any electric company in the United States.

In accepting the award, CHARLES A. COLLIER, vice president of the Georgia Power Company, credited the people of Georgia with the achievements that brought the award to the company.

The Charles A. Coffin Medal and a cash award of \$1,000 are offered annually by the GENERAL ELECTRIC COMPANY to a member of the electric industry for a distinguished contribution to the advancement of electric service. The Georgia Power Company was one of five companies in the entire electric industry invited to compete for the award on the basis of achievements in 1950.

Louis V. Sutton, president of the Edison Electric Institute, praised the Georgia Power Company for its great contribution to the progress and well-being of the state of Georgia and for achievement of unusual public appreciation of the company and the American economic system.

Westinghouse Names Slusser

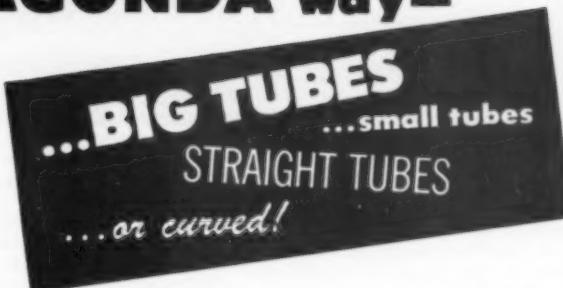
Appointment of MARK F. SLUSSER as administrative assistant, industrial products sales, for the WESTINGHOUSE ELECTRIC CORPORATION, has been announced.

Mr. Slusser will have direct responsibility for coordination of activity on compliance with price control regulations. He also has been assigned duties in connection with service on renewal parts and will assist the sales manager in following up key projects.

A native of Blacksburg, Virginia, Mr. Slusser was graduated from Virginia Polytechnic Institute. He joined Westinghouse in 1929.

Later he worked for the Company in BLUEFIELD, WEST VIRGINIA, and for an agent of Westinghouse in BRISTOL, VIRGINIA. He returned to Westinghouse at East Pittsburgh in 1942, and in 1949 became assistant to the sales manager of industrial products at the headquarters office.

Clean them the LAGONDA way—



LAGONDA gives you the *right* cleaner for any tube cleaning job in your plant—all the way from $\frac{1}{2}$ in. tubes up to 20 in. I.D. pipes. Utilize the 50 years of tube cleaning experience back of LAGONDA—the oldest name in tube cleaning. Write today for the LAGONDA Bulletin.



SUSPENSION CLEANERS

For small straight tubes. Motor remains outside of tube. Air, steam, or electric drive.



600 SERIES — For small tubes, straight or curved. For a fine cleaning job on tubes $\frac{1}{2}$ to $1\frac{1}{2}$ inches.



1300 SERIES — Air-driven cleaner for boiler tubes, straight or curved.

SURE CURE FOR LEAKY HANDHOLE SEATS!

When replacing handhole covers, prevent costly leaks by regrinding the seat with a LAGONDA Handhole Seat Grinder. Grinder clamps to header with a positive action that insures an accurate, single-plane motion of abrasive wheel. Steam cuts and pittings are easily and economically ground out. The cover mates with seat for an absolute leakproof fit. Write for the Handhole Seat Grinder Bulletin.



Y-305

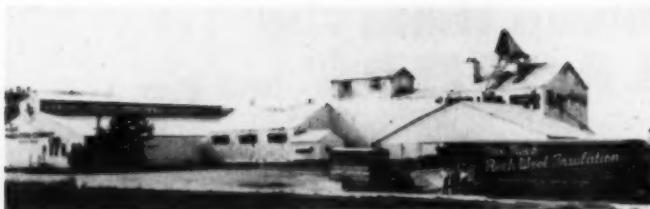


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DISTRICT OFFICES IN PRINCIPAL CITIES



Baldwin-Hill Acquires Temple, Texas Plant

Mr. W. H. Hill, President of BALDWIN-HILL COMPANY, Trenton, New Jersey, has just announced the purchase of the Tex-Rock Insulation Manufacturing Company, TEMPLE, TEXAS.

Mr. Hill stated that the addition of the Texas plant to the three present Baldwin-Hill factories located at Trenton, N. J., Kalamazoo, Mich., and Huntington, Ind., was made to meet the rapidly growing demand for both industrial and domestic insulation materials throughout the Southwest.

The new division of the Baldwin-Hill Company will manufacture and distribute insulating blankets, felts, insulating cements, pipe covering, fill insulation and board and block insulation.

The Texas Plant will also manufacture batt and blown mineral wool for home insulation.

New machinery will be installed in the Temple Plant and the entire operation modernized in order to keep pace with the latest technical improvements in the production of insulating materials. The new manufacturing facilities will be put into operation as soon as the modernization program is completed.

GEORGE W. ELLIOTT, formerly President of the Tex-Rock Insulation Manufacturing Company, will continue in the sales management capacity of this plant.

Wheelco—W. Va.

THE WHEELCO INSTRUMENTS Co. has opened a new district agency for the State of WEST VIRGINIA. The new

agent, ENGINEERING PRODUCTS COMPANY, Box 1107, CHARLESTON 25, WEST VIRGINIA, is under the direction of Mr. F. E. ANDERSON.

New Dampney Distributors

THE DAMPNEY COMPANY, Hyde Park, Boston 36, Massachusetts, manufacturer of protective coatings for metal, announces the appointment of three industrial distributors. W. C. CHRISTENSEN, 129 Texas Avenue, JACKSON 46, MISSISSIPPI, has been assigned territory in southern MISSISSIPPI and northeastern LOUISIANA. MARSHALL, NEIL & PAULEY, INC., 811 York Street, HOUSTON 3, TEXAS, will represent Dampney in southeastern TEXAS; and MARINE SPECIALTY COMPANY, 6 South Water Street, MOBILE 8, ALABAMA, will add to their present marine coverage of the Port of Mobile industrial representation in surrounding territory in MISSISSIPPI, ALABAMA and FLORIDA.

Chelsea Fan & Blower—Texas

CHELSEA FAN AND BLOWER COMPANY, Plainfield, New Jersey, announces the appointment of H. R. ONARECKER AND COMPANY of 2518 Times Blvd., HOUSTON, TEXAS, as their representative for the State of Texas.

H. R. ONARECKER and WAYNE D. CLOSE, partners in this organization, are experienced electrical engineers and are available to answer any engineering questions pertaining to Chelsea's full line of industrial, commercial and residential fans.

Owens-Illinois—Atlanta

OWENS-ILLINOIS GLASS COMPANY has assigned FRANK A. DAVENPORT as Kaylo Sales Engineer in ATLANTA, GEORGIA. Mr. Davenport replaces C. H. RAMIEN, who is now acting as Resident Engineer at a Kaylo installation for Gulf Oil at PORT ARTHUR, TEXAS.

The Atlanta sales territory includes the states of NORTH CAROLINA, SOUTH CAROLINA, eastern TENNESSEE, GEORGIA, ALABAMA and FLORIDA.

W. T. Smith Lumber Co.—Alabama

A \$215,000 initial contract in the modernization program of the W. T. SMITH LUMBER COMPANY at CHAPMAN, ALA., was awarded to THE RUST ENGINEERING COMPANY, of BIRMINGHAM, and PITTSBURGH. Work will begin this fall, according to an official of the Rust firm.

Contract calls for design and construction of additions to the boiler

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The Manzel logo consists of the word "Manzel" written in a stylized, flowing script font.

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Why it Pays to Select Manzel Lubricators

- THEY LENGTHEN THE LIFE OF MACHINERY
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- THEY CUT OIL CONSUMPTION UP TO 90%

Manzel Lubricators supply the exact amount of oil needed at each wearing point, reducing oil consumption as much as 90%.

They are furnished as standard equipment on leading makes of engines, and machinery. Or they can be installed on your present equipment.

We will gladly have a Manzel lubricator engineer submit recommendations without obligation. Just write...

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High grade gas, by-product, steam and household stoker coal from Wise County, Virginia, on the Interstate Railroad.



High grade gas, by-product, steam and domestic coal from Wise County, Va., on the Interstate Railroad.



High grade, high volatile steam and by-product coal from Wise County, Va., on the Interstate Railroad.



The Premium Kentucky High Sulfur unmatched for domestic use. Produced in Harlan County, Kentucky, on the L & N. Railroad.



Roda and Stonega from Wise County, Va.



High grade gas, by-product, steam and domestic coal—Pittsburgh seam from Irwin Basin, Westmoreland County, Pennsylvania, on the Penna. Railroad.



High volatile domestic, steam and by-product coal from Boone and Logan Counties, W. Va., on the Chesapeake & Ohio Ry.



Genuine Pocahontas from McDowell County, W. Va., on the Norfolk & Western Railway.



High fusion coking coal for by-product, industrial stoker and pulverizer use from Wyoming Co., W. Va., on the Virginian Ry.

ANTHRACITE

Hazle Brook—*Premium Lehigh*
Raven Run—*Premium Mahanoy*

Capable engineering personnel and the experience gained through long and varied marketing activity assure proper application of one of the above brands and effective servicing of any fuel requirement.

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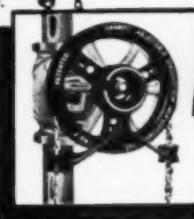
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POSITIVE! EFFICIENT! SAFER!
**VALVE CONTROL
AT LOWEST COST!**



INSTALLED, AND OPERATING,
IN ONLY A FEW MINUTES

- Here's easy, convenient, instant control of overhead, out-of-reach valves—right from the floor! No expensive apparatus! No switches! Nothing to break down when most needed! BABBITT Adjustable Sprocket Rim with Chain Guide, with only four simple parts, gives you positive efficient valve control at lowest cost!
- Prevents accidents, prevents waste, provides efficient control, and saves money. A range of 10 ADJUSTABLE sizes fits all valve wheels, with rising or non-rising stems, from 2 to 30 inches in diameter.

Jenkins Brothers, Atlanta, has complete stock. Other distributors in principal cities. Order for Catalog Folder SP-2.

BABBITT STEAM SPECIALTY CO.

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NEW BEDFORD, MASSACHUSETTS

ATLAS Damper Regulators

WHAT THEY DO:

- We cannot give all details here. But, here is a brief outline:
1—Control air to maintain the desired pressure.
2—Control the speed of fans.
3—Regulate rate of feed of stokers.
4—Reduce amount of air used to the desired minimum.

- 5—Higher and more efficient performance temperature is attained and maintained.
6—Regulate CO₂ and avoid CO.
7—Save considerable fuel.
8—Save labor.
9—Quickly pay for themselves.



ATLAS Damper Regulator No. 600. For boiler pressures up to 150 lb.

ATLAS VALVE COMPANY

275 South St., Newark 5, N. J.

Representatives:

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presented below:
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 - Water Regulators
 - Reducing Valves
 - Pressure Regulators
 - Exhaust Control Systems

plant, including installation of a new 50,000 pph boiler, and changes in existing equipment.

The new boiler will be designed to operate initially at low pressure to fill steam requirements for the entire plant, while its ultimate operation will be at high pressure to handle the plant's electrical requirements.

Rubber Manufacturers Elect Robins

THOMAS ROBINS, JR., President of HEWITT-ROBINS, INC., and President of the newly reactivated KENTUCKY SYNTHETIC RUBBER CORPORATION, LOUISVILLE, KY., has been elected a director of the RUBBER MANUFACTURERS ASSOCIATION. Four other directors were re-elected for three-year terms to the Association's fifteen-member board.

Hewitt-Robins, Inc., the industrial rubber products and foam rubber manufacturing company that Robins heads, makes and engineers complete materials handling installations.

A member of the Hewitt-Robins organization for 32 years, he has been President for 16 years.

Last fall Robins was also elected President of the Kentucky Synthetic Rubber Corporation, a newly reactivated government-owned synthetic

rubber plant at Louisville, Ky., which is operated under contract with the Reconstruction Finance Corporation by ten rubber companies outside of the tire division of the rubber industry. Kentucky Synthetic was the second such rubber plant to be called back into service following the Korean crisis.

Propane-Powered Airplane

LANDRUM L. HUGHES of A. O. SMITH CORP. attracted wide attention at the Liquefied Gas Petroleum Association convention in Chicago when he flew his propane-powered airplane from Oklahoma City to the convention.

Mr. Hughes reported that the fuel cost for his air trip was about \$4, as compared with an estimated cost of \$15, had he used gasoline.

The plane Mr. Hughes flew was an Aeronca 4-passenger sedan powered with a 145-horsepower Continental engine. It is the only plane in the country licensed to use propane as fuel.

The engine is fitted with the same type LP-Gas carburetion adapter that is being marketed by A. O. Smith's Rural Sales Division for farm tractors, buses, trucks and passenger cars.

Ward S. Patterson Dies

WARD S. PATTERSON, executive assistant to the vice president in charge of engineering, COMBUSTION ENGINEERING - SUPERHEATER, INC., New York, died on May 21.

Mr. Patterson studied engineering at Cornell University, graduating in 1926 with the M. E. degree. Joining Combustion Engineering immediately upon graduation, he served in various capacities, later heading up the calculating engineering group and more recently becoming executive assistant to the vice president in charge of engineering.

Texas Gas Names Stevenson

W. T. STEVENSON has been elected president of TEXAS GAS TRANSMISSION CORPORATION.

J. H. HILLMAN, JR., formerly president and chairman of the board, will continue as chairman of the board.

Mr. Stevenson has been executive vice president and director of Texas Gas since the Company was formed in 1948.

He was introduced to the natural gas industry in 1926 when he joined the Kansas City office of Arthur Andersen & Co., public accountants, to specialize in gas utilities.

In 1928 he was assigned to do work for Kentucky Natural and the next year joined the Company as assistant treasurer and director. He is also president of Western Kentucky Gas Company.

NCG—Miami

THE NATIONAL CYLINDER GAS COMPANY is constructing a liquefaction plant in MIAMI, FLORIDA, for the production of oxygen and nitrogen. It is scheduled to be completed in August and will have a capacity of approximately 5 million cubic feet per month.

The company has an acetylene plant in Miami but formerly has supplied the Miami area with oxygen and nitrogen from its Jacksonville plant.

The new Miami facilities will be under the general supervision of G. L. REYNOLDS, the firm's Florida district manager.

Goodrich—Oklahoma

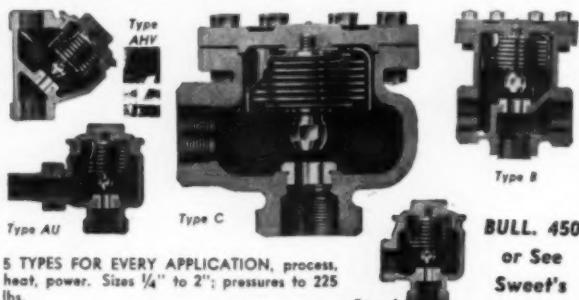
G. ALLEN SPAULDING, with THE B. F. GOODRICH COMPANY since 1940, has been made production superintendent of the Company's MIAMI, OKLAHOMA, tire plant.

Spaulding, an industrial engineer, succeeds William L. Carpenter who has recently been named plant manager of the Company's tire plant in Oaks, Pa.

In This Plant Nicholson Traps SAVED 10% IN STEAM COSTS

Chief Engineer H.F.D. stated, after Nicholsons replaced mechanical traps in his plant: "Saving in steam waste cut our fuel cost at least 10%. Yet application temperatures were up 30°-40°. And relief of all air binding effected faster warm-up."

Operate on lowest temperature differential; 2 to 6 times average drainage capacity; maximum air venting. For other advanced Nicholson features send for Bulletin 450.



5 TYPES FOR EVERY APPLICATION, process, heat, power. Sizes 1/4" to 2"; pressures to 225 lbs.

W. H. NICHOLSON & CO., 175 Oregon St., Wilkes-Barre, Pa.

Sales and Engineering Offices in 57 Principal Cities

Eggelhof Engineers—Dallas

EGGELHOF ENGINEERS, representing manufacturers of industrial controls and equipment, announces the appointment of J. A. WILSON as Assistant Manager, Dallas Division. In this capacity he will handle a part of DALLAS and the entire FORT WORTH-WACO area. JACK RUSH will continue to cover the balance of Dallas and the North Texas area.

Graduating in 1941 from the University of Oklahoma in Mechanical Engineering, Wilson spent four years as a process and development engineer with several equipment manufacturers—including work on the Manhattan District Project. Since 1945 he has been a field engineer with the Elliott Company both in Tulsa and Dallas. He brings to the Eggelhof Engineers organization valuable experience in heavy plant equipment such as surface and barometric condensers, steam ejector equipment, turbines and centrifugal compressors, feed water heaters and power plant auxiliaries.

Cleco—Kansas City and Memphis

THE CLECO DIVISION of REED ROLLER BIT COMPANY, Houston, Texas, has announced the appointment of Vogl

Tool Company, KANSAS CITY, MISSOURI, and HAYS SUPPLY COMPANY, MEMPHIS, TENNESSEE, as distributors in those areas.

They will handle the complete lines of Cleco and Dallett air tools and accessories.

Southern Engine & Pump Co.—Houston

J. R. FEINBERG, formerly Master Mechanic for Kerr McGee Oil Industries, Gulf Coast Division, has accepted a position as Sales Engineer for the SOUTHERN ENGINE & PUMP COMPANY, 900 St. Charles St., Houston 1, Texas, LE ROI ENGINE and GOULDS PUMP distributor for the Southwest.

Mr. Feinberg brings to the organization a varied background that includes oilfield and industrial application of Diesel engines and their auxiliaries.

Peden Elects Morse—Houston

GEORGE T. MORSE, JR., who went to work for the PEDEN IRON AND STEEL CO., HOUSTON, TEXAS, as a clerk in 1928, became president and general manager of the company recently.

As soon as he was notified of his election, Mr. Morse announced the appointment of W. E. Blumberg as sales manager, industrial division. Mr. Blumberg, a native of Hempstead, has been with Peden Iron & Steel about 20 years and has been most recently in charge of reinforcing steel sales.

Credit Men Elect Purvis, Atlanta

GILBERT PURVIS, treasurer of ATLANTIC STEEL COMPANY, ATLANTA, was elected Director of the NATIONAL ASSOCIATION OF CREDIT MEN, at the annual convention of the Association held in Boston.

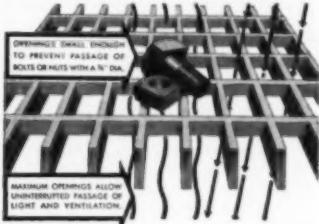
Purvis has been connected with Atlantic Steel Company in various capacities for 23 years, and has been company treasurer since 1946.

GE Welding Div.—Alabama

THE ALABAMA OXYGEN COMPANY has been appointed to handle the BIRMINGHAM area for GENERAL ELECTRIC'S WELDING DIVISION, Fitchburg, Mass. Sole independent manufacturer of oxygen and acetylene in the state, the company is the second G-E welding distributor in this region. W. E. ROLLS is manager of the firm.

The new distributors are authorized to carry a complete line of a-c, d-c inert-arc, and atomic-hydrogen welding equipment as well as mild, low alloy, hard-surfacing, stainless steel, and new hi-thoria electrodes.

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New Headquarters for Collier, Hyster Distributor in Texas

Here are the new headquarters of the C. H. COLLIER COMPANY at 154 Payne Street in DALLAS, TEXAS. Head of the company, largest dealer for Hyster equipment in Texas, is C. H. COLLIER, Sr., identified with the heavy machinery business more than 20 years.

New GE Departments

Six manufacturing affiliates of the GENERAL ELECTRIC COMPANY became departments of the parent company on June 30.

The affiliates are CARBOLOY CO.,

A native Texan, Collier had practical engineering experience in the railroad, municipal and highway engineering and construction fields before becoming general sales manager for one of the largest shovel and dragline manufacturers in the country.

INC., with headquarters in Detroit; GENERAL ELECTRIC X-RAY CORP., Milwaukee; LOCKE INC., Baltimore; TELECHRON INC., Ashland, Mass.; MONOWATT INC., Providence, R. I.; and THE TRUMBULL ELECTRIC MANUFACTURING Co., Plainville, Conn.



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Catalogs and Bulletins

(Continued from p. 18)

For more data circle item code number
on the postage free post card — p. 17

B-10 ARC WELDERS—Bulletin, 2 pages—Illustrates and describes arc welders for sheet metal production and repair. Includes table of power requirements, dimensions, shipping weight, and photographs of models available.—LARKIN ELECTRO PRODUCTS CO., Pine Bluff, Ark.

B-11 INDUSTRIAL WATER CONDITIONING—Brochure, 12 pages—“Water Patrol for Profit Control” discusses control of scale, corrosion, and algae in relation to profits of industrial plants. Colored charts and illustrations accompany non-technical explanation.—AQUATROL, INC., P. O. Box 1223, Houston, Texas.

B-12 PLASTIC COATING—Bulletin, 12 pages—Vinyl plastic coatings to control corrosion and deterioration of steel, concrete, brick, formed block and plywood. Also for tank linings. Gives specific qualities and resistance chart. Coatings are non-contaminating, tough, and effective against caustic sterilizing and cleaning agents; usually long lived.—CASEY & CASE COATING COMPANY, P. O. Box 151, Maywood, Calif.

B-13 SCREW CONVEYORS—Catalog Section 200-B, 36 pages—Illustrates and describes screw conveyors in many types and assemblies for handling various materials. Typical applications for products and industries are listed. Dimensions, prices, diagrams, and photographs are included.—FORT WORTH STEEL & MACHINERY CO., 3600 McCart St., Fort Worth, Texas.

B-14 TRACTOR SHOVEL—Catalog “Model HA Payloader”—Describes a 12 cu. ft. tractor shovel for bulk material handling. Application photographs show job and industries where the unit is useful.—THE FRANK G. HOUGH CO., 578 Seventh St., Libertyville, Ill.

B-15 INDUSTRIAL CLEANING—Booklet “Cut Maintenance Costs with Dowell Service,” 8 pages—Describes method of cleaning industrial equipment with chemicals and includes “before” and “after” photographs of actual applications.—DOWELL INCORPORATED, Dept. P. P. O. Box 526, Tulsa 2, Okla.

B-16 TRANSMISSION DRIVES—Catalog No. C-72-51—detailed discussion of operating principles behind chain drives; new design principles; operation in field of high-speed, heavy-duty power transmission; capacities, speed ranges and service factors for selecting power transmission drives. Installation and lubrication procedures.—MORSE CHAIN COMPANY, 7601 Central Ave., Detroit 8, Mich.

B-17 TURBINE PUMPS—Bulletin R-159, 20 pages—Illustrates and describes vertical, close-coupled turbine pumps for line pumping, process pumping, booster pumping, air conditioning, sump and pit pumping, drainage and dewatering, recirculation.—PEERLESS PUMP DIVISION, Food Machinery & Chemical Corp., 301 West Avenue 26, Los Angeles 31, Calif.

B-18 WATER TREATMENT—Bulletin 1525, 28 pages—Discusses necessity of treatment of boiler make-up, chemistry involved, selection of equipment, and describes the hot process Accelerator. Illustrated with diagrams and photographs.—INFILCO, INC., Tucson, Arizona.

B-19 LOCKNUTS—Folder, 4 pages—Describes two types of locknuts: one with a tough nylon plug insert in one of the hex faces on the nut between top and bottom as its locking element; one containing treated hexagonal fibre washer as locking medium. Discussed industrial applications.—TOWNSEND COMPANY, New Brighton, Pa.

B-20 OIL CONDITIONER—Bulletin, 4 pages—Describes “Powersol,” a fuel oil conditioner to add to fuel oil supply tanks to eliminate tank sludge, clean clogged

lines, pre-heaters, strainers, reduce carbon at burner nozzles and improve combustion.—POWER PLANT PRODUCTS CO., 92 Federal St., Boston 10, Mass.

B-21 METALLIZING—Meteo News, Vol. 5, No. 5, 6 pages—Describes case histories of material and money saving applications of metallizing, including cooling drums, axle housings, pistons, steel tire molds, and pins. Discusses self-bonding molybdenum metallizing wire.—METALLIZING ENGINEERING CO., INC., 38-14 30th St., Long Island City 1, N. Y.

B-22 PACKINGS AND GASKETS—Catalog P-196C, 32 pages—Illustrates and describes the company's 95 most popular packings and gaskets, including construction, service recommendations, and size information.—RAYBESTOS - MANHATTAN, INC., Packing Division, Massapequa, Pa.

B-23 DISPATCH SYSTEMS—Bulletin AD-1, 12 pages—Describes automatic dispatch systems for dispatch between two stations, to multiple stations, to single station, and other applications demonstrated with line diagrams.—THE AMERICAN MONORAIL COMPANY, 13107 Athens Ave., Cleveland, Ohio.

B-24 INDUSTRIAL OILERS—Broadside "Series 4900," 4 pages—Designed to aid lubrication and maintenance men in selecting the proper visible, automatic oiler for constant level, gravity, wick, underfeed, multiple and large capacity gravity feed applications.—TRICO FUSE MFG. CO., 2948 N. 5th St., Milwaukee 12, Wis.

B-25 BOILER FEED PUMPS—Bulletin 1525, 12 pages—Describes De Laval high pressure barrel-type boiler feed pump available for pressures to 3000 psi. Includes cross-section drawing and photographs.—DE LAVAL STEAM TURBINE COMPANY, Trenton 2, N. J.

B-26 INDUSTRIAL COATING—Bulletin 9, 8 pages—Explains the "Phosphate Process" for the pickling and painting of steel plates, angles, channels, and other shapes produced by rolling. Contains operational photographs and drawings.—CHICAGO BRIDGE AND IRON COMPANY, 332 South Michigan Ave., Chicago 4, Ill.

B-27 HYDRAULIC PULLER—Bulletin, 5 pages—Describes the company's new hydraulic puller (capacity 17½ tons—weight 18 pounds) adaptable to their pulling system now in use. Illustrates methods for industrial use.—OWATONNA TOOL COMPANY, 295 North Cedar St., Owatonna, Minn.

B-28 ROLLER CONVEYORS—Catalog No. 60, 16 pages—Shows wide variety of roller conveyor types and includes selection data and diagrams. Illustrates industrial applications and explains use of roller conveyors in conjunction with wheel type conveyors.—THE E. W. BUSCHMAN CO., Dept. 45, Clifton & Spring Grove Aves., Cincinnati 22, Ohio.

B-29 INDUSTRIAL INSTRUMENTS—Bulletin 51-667, 20 pages—Describes line of draft and low pressure instruments, including indicators, recorders, and controllers. Application table aids in selection of correct instrument. Illustrated and indexed.—THE HAYS CORPORATION, Michigan City, Indiana.

B-30 LADDERS—"Safety-Step" Bulletin, 6 pages—Describes all-steel mobile ladders available in models with from one to eight steps, and new 4-step ladder for use with stock carts. Illustrated.—BALLYMORE COMPANY, Wayne, Pa.

B-31 MOTORS—Bulletin 05BT150A, 6 pages—Describes types of construction and ratings of the company's improved totally-enclosed, fan-cooled motors with tube-type, air-to-air heat exchangers. Discusses operation for industrial installations.—ALLIS-CHALMERS MFG. CO., Box 512, Milwaukee, Wis.

B-32 SPRAY NOZZLES—Bulletin N-617, 26 pages—Covers involute nozzles for spray cooling ponds, and smaller involute and flat-spray nozzles for general industrial processes. Illustrated with photographs of specific applications.—YARNALL-WARING COMPANY, Mermaid Lane, Chestnut Hill, Philadelphia 15, Pa.

B-33 HUMIDITY CONTROL—Bulletin K-151, 11 pages—Describes the Kathabar humidity control system by which product processing conditions with temperatures as low as -66°F can be maintained. Includes typical flow diagrams of actual installations.—SURFACE COMBUSTION CORPORATION, Toledo 1, Ohio.

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Industrial Power Conference—Dallas

(Continued from page 62—Also check page 39)

presses. It can have a 20-1 speed ratio and it runs from a-c current. Having such a speed range is important to job printers who handle a wide variety of paper size and weight.

J. A. Taylor described a recent installation of electrically driven blending conveyors in a stone crushing plant in Oklahoma. The plant crushes rock to several sizes, which are stored in bins. The sizes are then blended by mixing the output from conveyor belts leading from the bins to the loading point. The proper proportion of each type of stone is determined by the speed of the conveyors. Each belt is driven by an adjustable speed motor so that any desired blend may be achieved.

Polyphase Motors

Toward the end of the morning session, J. F. Macpherson, discussed the application of polyphase motors to Southwestern industry. Chemicals and oil are the two big fields for these motors, but their use in irrigation pumping is growing. He suggested that power salesmen survey foundries, laundries, dairies, bakeries, lumber mills, printing plants, and the rock industry in an effort to find more applications. These, he said, are the industries in the Southwest which are "backward" electrically.

J. N. Poore, Petroleum Specialist, then discussed the specific application of polyphase motors to water flooding and oil field pumping. While electric motors have long been used as a drive for oil field pumps, there is a new application arising as more and more fields are resorting to water flooding to get more oil from the wells. This system involves pumping water down into the oil bearing strata so that the oil is driven into the main pool.

Chemical Applications

First paper of the afternoon session dealt with application of motors to the Chemical and Refining Industry. J. L. Hixon of General Electric in Houston, emphasized the importance of proper installation as well as proper selec-

tion of motors. He said that the cost of motor installations had increased from an average of \$80 per hp in 1936 to \$180 per hp in 1951. High installation costs make it more important than ever that the job be done right.

Lighting Trends

V. J. Graham, Lamp Department, District Engineer, presented an excellent talk on the variety of applications for lighting and heat lamps which have come into use in the past few years. He showed slides of lighting used for different types of inspection work.

Directional lighting, for example, is used for inspecting metal surfaces for scratches. Light glancing off the metal from a source set above, clearly shows up scratches.

Transmitted light, passing through the material being inspected, is used for inspection of light weight textiles. Reflected light is ideal for inspection of bright metal and high intensity light in combination with magnifying glass is used commercially for the inspection of small parts.

Polarized light is used to inspect any kind of transparent material for strain, while black light has been found to be the solution for locating worms in pecans. The worms glow brightly under the black light.

Mr. Graham also showed photographs of the new high bay lighting bulbs for dirty locations. The reflector is built into the bulb in a design similar to a sealed beam headlight. These bulbs greatly reduce maintenance by eliminating the need to clean reflectors.

Air Conditioning

B. W. Gettys, of General Electric's Dallas Air Conditioning Department, spent most of his speaking time on the heat pump, which he feels has great possibilities in the Southwest. Heat pumps are not yet being commercially built by G.E. but they have several experimental units. It is hoped that they will be able to have a commercial design on the market soon, suitable for residential if not industrial use.

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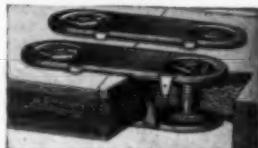
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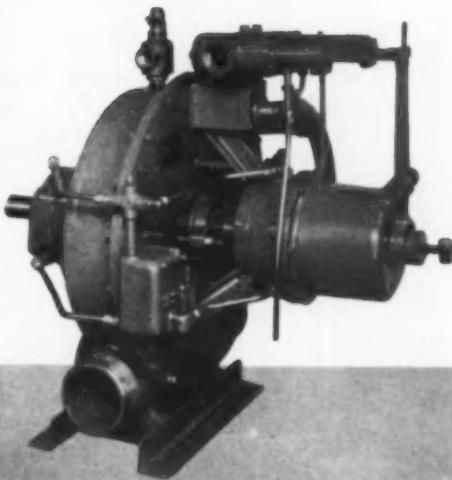


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A

Advertising Council, Inc.	•	Eagle-Picher Co.	..Third Cover
Air Preheater Corp.	•	Edward Valves, Inc.	.82 and 83
Allen-Bradley Co.	•	Elliott Co.	..109
Allis-Chalmers Mfg. Co.	•	Emerson Elec. Mfg. Co.	..107
Aluminum Co. of America	•	Engineer Co.	..*
American Blower Corp.	•	Erie City Iron Works	..77
American Coal Burner Co.	..119	Everlasting Valve Co.	..*
American Engineering Co.	•		
American Monorail Co.	..89		
American Pulverizer Co.	•		
Anaconda Wire Cable Co.	•		
Anderson Co., V. D.	•		
Armstrong Machine Works	..81		
Atlantic Steel Company	..79		
Atlas Mineral Products Co.	•		
Atlas Valve Co.	..111		

E

Fairbanks, Morse & Co.	..29
Finnigan, J. J., Co., Inc.	..119
Fisher Governor Co.	..*
Flexible Steel Lacing Co.	..117
Flexible Tubing Corp.	..*
Fluor Corp., Ltd.	..*
Fly Ash Arrestor Corp.	..120
Foster Wheeler Corp.	..*
Frick Company	..*
Fyr-Feeder Engineers	..119

B

Babbitt Steam Specialty Co.	..111
Babcock & Wilcox (Boilers)	..14 and 15
Babcock & Wilcox (Refractories)	..65
Bailey Meter Co.	..28
Baldwin-Hill Co.	..
Bay State Abrasive Products Co.	..9
Belco Industrial Equipment Div.	..
Belmont Packing & Rubber Co.	..
Biddle Co., James G.	..105
Bigelow-Liptak Corp.	..
Bird-Archer Co.	..97
Blaw-Knox Co., Power Pipe Division	..
Borden Metal Products Co.	..
Buell Engineering Co., Inc.	..99
Buffalo Forge Co.	..
Bunting Brass & Bronze Co.	..25
Bussman Mfg. Co.	..22 and 23
Byron Jackson Co.	..86

G

Garlock Packing Co.	..
General Coal Co.	..111
General Electric Co.	..20 and 21
Graver Water Conditioning Co.	..
Grinnell Co.	..
Gulf Oil Corp.	..33

H

Hagan Corp.	..1
Hajoca Corp.	..
Homestead Valve Mfg. Co.	..95
Hotel Pittsburgher	..

C

Carolina Refractories Co.	..121
Chapman Valve Mfg. Co.	..36
Chicago Bridge & Iron Co.	..122
Clarke Fan Co.	..
Classified Ads	..116
Cleaver Brooks Co.	..67
Cochrane Corporation	..118
Cole Mfg. Co., R. D.	..
Combustion Engr. Superheater Inc.	..13
Combustion Equipment Div., Todd Shipyards Corp.	..
Continental Gin Co.	..
Cooper-Bessemer Corp.	..
Coppus Engineering Corp.	..
Crane Company	..

J

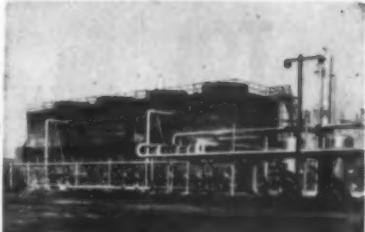
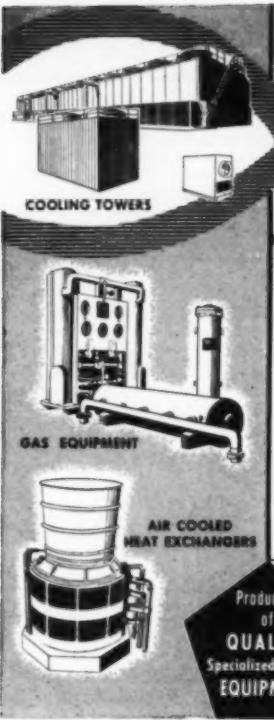
Jefferson Union Co.	..104
Jeffrey Mfg. Co.	..
Jenkins Bros.	..
Jerguson Gage & Valve Co.	..
Johns-Manville, Inc.	..11

D

Dart Mfg. Co., E. M.	..103
Davis Regulator Co.	..114
Detroit Stoker Co.	..
Dowell, Inc.	..
Dravo Corp.	..113

K

Kennedy Valve Mfg. Co.	..
Kewanee Boiler Corp.	..121
Kirk & Blum Mfg. Co.	..



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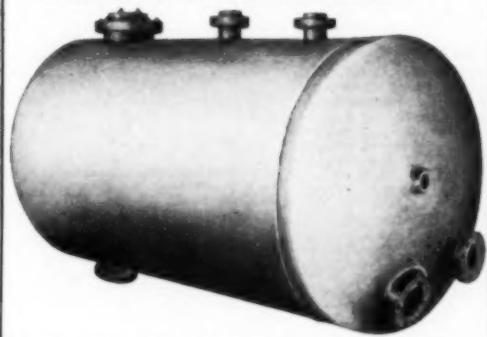
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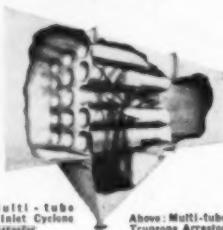
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Above: Multi-tube Trunnion Arrestor

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Index of ADVERTISERS

This Advertisers' Index is published as a convenience, and not as part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

L

Leslie Co.	120	Smith Corp., Winfield H.	85
Liberty Engineering & Mfg. Co.	*	Smooth-on Mfg. Co.	*
Link-Belt Co.	27	Southern Coal Co., Inc.	*
LUBRIPLATE DIVISION		Southern Natural Gas Co.	*
Fiske Bros. Refining Co.	84	Southern Railway System.	*
		Sprague Electric Co.	117
		Springfield Boiler Co.	
		Squires Co., C. E.	108
		Standard Oil Co., Inc.	38
		Sterling Electric Motors Inc.	102
		Sturtevant, B. F., Div., Westinghouse Electric ...	31
		Subco, Inc.	121
		Superior Combustion Industries, Inc.	71
		Swartwout Co., The....	74

M

Manning, Maxwell & Moore, Inc.	*	Taylor Forge & Pipe Works	*
Manzel, Inc.	*	Terry Steam Turbine Co., The ...	12
Mason-Nellon Regulator Co.	*	Texas Co.	*
Mercoind Corp.	*	Thermite Corp.	*
		Todd Shipyards Corp., Div., Combustion Equipment ...	*
		Tri-Lok Co.	113

N

National Airoil Burner Co.	115	National Aluminate Corp.	*
National Tube Co.	*	National Valve & Mfg Co.	32
National Equipment Division, Continental Foundry & Machine Co.	36	Niagara Blower Co.	*
		Nicholson & Co., W. H.	112
		Northern Equipment Division, Continental Foundry & Machine Co.	*

O

Oakite Products, Inc.	113	Oxonite Co.	115
----------------------------	-----	------------------	-----

P

Pacific Pumps, Inc.	*	Pearless Pump Division	
Food Machinery & Chemical Corp.	35	Food Machinery & Chemical Corp.	*
Permutit Co.	*	Permuthit Co.	*
Pittsburgh Corning Corp.	*	Pittsburgh Cordage Co.	*
Pittsburgh Piping & Equipment Co.	*	Powell Co., Wm.	34
Plymouth Cordage Co.	*	Powers Regulator Co.	108
Rubber Cover		Prat-Daniel Corp.	*
Prat-Daniel Corp.	*	Preferred Utilities Mfg. Corp.	*
Pritchard Co., J. F.	119	Proportioneers, Inc.	*
Proportioneers, Inc.	*		

R

Raybestos-Manhattan, Inc.	*	Rubber Cover	
Packing Division	*	Reliance Gauge Column Co.	73
Reliance Gauge Column Co.	*	Republic Flow Meter Co.	*
Republic Rubber Division (Lee Rubber & Tire Corp.)	24	Republic Rubber Division (Lee Rubber & Tire Corp.)	*
Riley Stoker Corp.	*	Riley Stoker Corp.	*
Robbins & Myers, Inc.	98	Robbins & Myers, Inc.	*

S

Sarco Co., Inc.	121	Shell Oil Co.	*
		Sinclair Refining Co.	*

T

Taylor Forge & Pipe Works	*	Terry Steam Turbine Co., The ...	12
Terry Steam Turbine Co., The ...	*	Texas Co.	*
Texaco Co.	*	Thermite Corp.	*
Thermite Corp.	*	Todd Shipyards Corp., Div., Combustion Equipment ...	*
Todd Shipyards Corp., Div., Combustion Equipment ...	*	Tri-Lok Co.	113

U

U. S. Hoffman Mch. Corp.	86	U. S. Treasury.....	*
United States Steel Co.	*		

V

Vulcan Soot Blower Div., Continental Foundry & Machine Co.	*
---	---

W

Wagner Electric Co.	93	Waldron Corp., John.	*
Walworth Co.	101	Want Ads	116
Warren Steam Pump Co., Inc.	*	Warren Steam Pump Co., Inc.	*
Western Precipitation Corp., Westinghouse Electric Corp., (Apparatus Div.)	68 and 69	Western Precipitation Corp., Westinghouse Electric Corp., (Apparatus Div.)	*
Westinghouse Electric Corp., (Elevator Div.)	*	Westinghouse Electric Corp., (Elevator Div.)	*
Wheeler Mfg. Co., C. H.	*	Wheeler Mfg. Co., C. H.	*
Wickes Boiler Co.	61	Wiegand Co., Edwin L.	*
Wiggins Co., Edwin L.	115	Wing Mfg. Co., L. J.	117
Worthington Pump & Machinery Corp.	26	Worthington Pump & Machinery Corp.	*

Y

Yarnall-Waring Co.	19 and 63
-------------------------	-----------

Z

Zink Co., John.	*
----------------------	---

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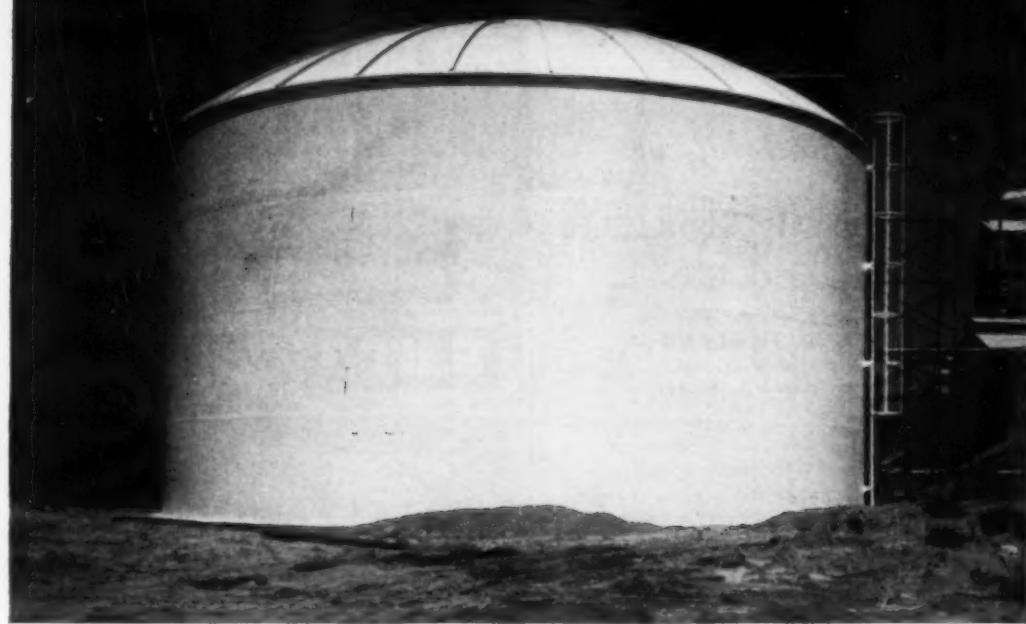


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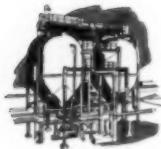
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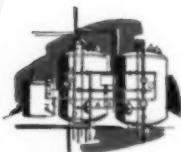
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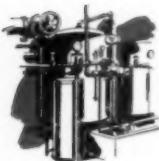
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